

THE BUTTERFLIES NAMED BY J. F. GMELIN
(LEPIDOPTERA : RHOPALOCERA)



BY
RICHARD IRWIN VANE-WRIGHT

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SYNOPSIS

An historical review is given concerning the 26 butterfly names introduced by J. F. Gmelin. All these names appeared in the 13th edition of Linnaeus' *Systema Naturae* (1790), the great majority being based on previously unnamed descriptions of butterflies published by I. I. Zschach in *Museum Leskeanum* (1788-9). The fate of the Leske specimens is traced to the present day, and full synonymies are presented for all the species concerned. Two of the names are re-instated (at the subspecies level) giving a total of nine Gmelin names currently in use for recognized butterfly species or subspecies. Eleven new synonymies are established, four previous synonymies re-established, and 37 lectotypes designated (14 for Gmelin names, the remainder for taxa erected by other authors). In addition, neotypes are designated for three of the Gmelin species. Brief observations are given concerning the importance of Ambon and Surinam as type-localities, and the apparent survival of Cramer material in the British Museum (Natural History).

INTRODUCTION

THIS WORK deals primarily with the classification of the 23 butterfly species named in 1790, by J. F. Gmelin, from descriptions in the catalogue of the N. G. Leske collection (Karsten, 1789; see Pl. I, fig. 2). Gmelin published these names in the 13th edition of Linnaeus' *Systema Naturae*, of which work Gmelin was effectively both author and compiler. The 13th *Systema Naturae* includes a large number of new names, normally attributed to Gmelin *in* Linnaeus, the great majority of which were coined by Gmelin for previously unnamed animals, plants and minerals

already described or illustrated in the literature. Sherborn (1902) lists all the Gmelin animal names, but in many groups of insects they have been almost completely ignored (Diptera), or partially ignored (Coleoptera, Orthoptera). The butterflies, however, have been largely accounted for, at least from a nomenclatorial standpoint, due to a series of chance events. Almost all were named from the Leske collection, which was shortly afterwards purchased by the then Dublin Society. Over 50 years later the remains of the collection came to the attention of W. F. Kirby, who was then working in Dublin. Kirby (1869; 1871; 1877), who at that time was preparing his pioneer butterfly catalogue, drew attention to the general problem of the Gmelin names, at the same time accounting in detail for the majority of the butterfly species involved. As already indicated, however, in many groups of insects the Gmelin names are still ignored, even for the purposes of primary homonymy. Since the classification and nomenclature of butterfly species has reached a relatively advanced stage, it seems appropriate, some 100 years after the appearance of Kirby's catalogue, to review the Gmelin butterfly species again. In doing so, some fresh insight has been gained concerning the problems of the Gmelin names and the Leske collection. It is hoped that the present paper will be of use not only to butterfly workers, but also to those who may wish to tackle the problems raised by Gmelin names in other groups.

HISTORICAL REVIEW

In 1788 G. Müller of Leipzig published a work by I. I. Zschach, the *Pars Entomologica* of *Museum Leskeanum* (Pl. 1, fig. 1). The latter (Pl. 1, fig. 2) was to be a catalogue of the collection of natural history objects, animal, plant and mineral, formed by Nathaniel Gottfried Leske. Of Russian parentage, Leske was living and working in Leipzig at the time of his death in 1786. He described himself as a 'natural historian and economist', being the author of a considerable number of popular articles, books and translations.

The first complete part of *Museum Leskeanum*, the *Regnum Animale* (Pl. 1, fig. 2), was published by Müller in the following year, 1789. This work, largely written and edited by D. L. G. Karsten of Marburg, included Zschach's *Pars Entomologica* as 'Classis V. Insecta' (Pl. 1, fig. 3), which comprised pages 1-136, the original pagination of Zschach. Classes I-IV take up pages I-XLIV, following Karsten's preface, etc.; the pagination of the work is thus rather complex, due to the prior publication of Zschach's contribution, the same type settings being used for both. It is interesting to note that Class VI, Vermes, follows on from the Insecta, as page 137, etc.

Karsten's contributions to *Museum Leskeanum* are based on the Linnaean system of classification, but for the insects Zschach followed Fabricius (Pl. 1, figs 1, 3). Zschach evidently considered the Leske collection to contain a large number of new species, or, perhaps more accurately, species which he could not recognise amongst the descriptive literature known to him. Whilst the known species were merely listed by Zschach (e.g. Pl. 2, fig. 5, species 1-5), these unknown species were described, but names were not given to them (e.g. Pl. 2, fig. 5, species 6;

Pl. 3, fig. 6). Thus in the *Pars Entomologica* each previously named species of an order is given a consecutive number (starting from 1), then an abbreviation indicating the section of the genus, then the specific epithet, and finally a literature reference. The unnamed species are numbered, but appear without a binomen or reference. Instead, after the abbreviated indication of the generic section, an asterisk appears, followed by Zschach's Latin description of the insect concerned (Pl. 2, fig. 5; Pl. 3, fig. 6). This pattern of presentation is followed for the hundreds of unnamed insects thus described by Zschach in *Museum Leskeanum*, all of which may be readily recognized by the asterisk mark.

In 1790 (Hopkinson, 1908), volume 5 of the 13th Linnaean *Systema Naturae* appeared, compiled by J. F. Gmelin, and also published in Leipzig. Within two to three years Gmelin's edition was entirely reprinted verbatim by Delamolliere at Lugduni, i.e. Lugduni Monachorum (not Batavorum), or Lyon (not Leiden). The format and pagination were identical with the original, but the type was reset and, although very accurate, the occasional misprint occurs. Since volume 1 (Animalia) had only one title-page for its seven bulky parts, only part 1 is identifiable at sight, each other part having simply its own half-title. Part 5, Insecta (1792) can be identified only by the misprints. So far only three of these have been noticed, all affecting the numbering of *Papilio* species: p. 2248 numbers run 878, 351, '44', 44 (they should be . . . 45, 44); p. 2250, number '336' should be 356; p. 2360, number '701' should be 901. Otherwise either printing appears satisfactory for study, provided one knows which is used. Since the bibliographic data for the reprint are identical, apart from the date and publisher's detail, with Gmelin's original, only the latter is listed in the references.

In the 13th *Systema Naturae* Gmelin listed all the published names known to him. In addition he named many new species, almost invariably it seems by reference to already published descriptions or illustrations of unnamed organisms, bestowing names on these for the first time. Gmelin also introduced a number of replacement names, where homonymies came to his attention (e.g. *Papilio philetetes* Gmelin, 1790 : 2364).

One such work to which Gmelin consistently referred was *Museum Leskeanum*, and he thus gave names to the great majority (but not all) of the unnamed insects described by Zschach. For each new species so named, Gmelin gave a page reference to the description in *Museum Leskeanum*, the Zschach species number, and a virtual copy of the latter's original description. To illustrate this we may take Zschach's *Papilio* 46c, which appears on page 89 of *Museum Leskeanum*, as the fourth species of section 6, the *Danai festivi* (Pl. 3, fig. 6). This should be compared with the entry for *Papilio* no. 887 (Pl. 3, fig. 7) which appears on page 2289 of Gmelin in Linnaeus, under the *Danai festivi*. The latter is the original description of *Papilio claviger* Gmelin; it is clearly drawn directly from Zschach's *Papilio* 46c, Gmelin's description being a barely altered paraphrase.

In 1792 the Dublin Society purchased the Leskean mineral cabinet (for a sum of about £1350; Berry, 1915 : 156); evidently at the same time they also received a large part, if not all, of the Leske zoological and botanical collections (White, 1911 : 8). It thus seems possible that a prime purpose of Karsten's work in cata-

loguing the Leske collection was to facilitate the sale of the material, at the same time providing a valuable record of a notable museum collection. According to Berry (loc. cit.) the Leske mineral collection was considered one of the finest in Europe in its day, Karsten also being an outstanding mineralogist. Berry unfortunately gives scant information on the Leske zoological material.

In 1813 a catalogue of the natural history specimens in the Dublin Society museum was published; the title page is shown in Pl. 1, fig. 4. It is evident from the short 'Advertisement' by Bernard O'Reilly which prefaces the work (Pl. 4, fig. 10), and also from some of the finer points in the work itself, that whoever made the catalogue was well versed in the systematic natural history of the time. Reference to the works of White (1911), Berry (1915), Praeger (1949) and a number of manuscripts and publications available in the National Museum of Ireland, has shed no light on the catalogue, or on Bernard O'Reilly. Unless proven otherwise, it seems practical to attribute this obscure work to the equally obscure O'Reilly. White (1911 : 10) even goes so far as to say that a directive issued in 1826 to Giesecke to collect insects in county Donegal is 'the first mention of an Entomological Collection in the Museum', when O'Reilly in fact, 13 years earlier, had already listed over 2500 species of insects in the Society's collections! Later, however, White (op. cit. : 14) probably unwittingly refers to O'Reilly's catalogue ('In 1843 the society called for a report . . . it refers . . . also to a Zoological Collection (Leskean) and the catalogue thereof'). The only clue to O'Reilly is a book published in 1818 (*Greenland, the adjacent seas, . . .*) by someone of the same name; Pl. 4, fig. 12 shows the entry for this work in the British Museum (Natural History) catalogue (1910 : 1476), and the vitriolic comment reprinted from the *London Quarterly Review* which accompanies it. Possibly the publication of this book so embarrassed the Dublin Society that all account of O'Reilly was banished from their records. Evidence that the two books are by one and the same O'Reilly is to be found on pages 97-98 of the 'Greenland' volume, where it is stated that 'the arrangement of such animals as I have seen is conformable to the system of Linnaeus, according to the last edition of his celebrated work by Gmelin'. In any event, it is highly unusual to find anyone with a clearly Irish name being credited with any contribution towards the Society's works at that time, the organization then being firmly in the control of the English and Anglo-Irish.

However, comparison of O'Reilly's catalogue with *Museum Leskeanum* indicates that the Dublin Society insect collection in 1813 was very largely made from the Leske collection, which they had purchased 21 years previously. The species numbers and names often correspond exactly with Zschach's work, with the interesting addition of Gmelin's names where Zschach had deferred to name them. At least on some occasions where Gmelin had ignored certain Zschach descriptions, the insect concerned is referred to as a variety of one of the others listed. In the great majority of cases, where in *Museum Leskeanum* the locality is given as 'Exoticus', in O'Reilly's catalogue this is rendered (needless to say, usually incorrectly) as 'India'. We may compare the entry shown on page 75 of O'Reilly for *Papilio* 46c (Pl. 3, fig. 8) with the corresponding entries in Zschach and Gmelin (Pl. 3, figs 6, 7). Thus O'Reilly gives for each such species the *Museum Leskeanum*

number of Zschach (which, according to the preface, would have been 'affixed to the subject' - see Pl. 4, fig. 10; this is largely confirmed by Kirby, 1869 : 355), the Gmelin name, an English name, and a rendering of 'exoticus' as 'India'. This pattern is repeated throughout, with a few minor changes. Perhaps the most interesting variation in the butterflies concerns the first species named from the *Museum Leskeanum* material - no. 6 (Pl. 2, fig. 5). Gmelin called this *Papilio argyrios*, but O'Reilly lists this as '6. P. E. A. Leskii. Leskean Butterfly. India' (Pl. 4, fig. 11), this being one of a few species in the catalogue so named after Leske, and which seem to constitute the only recognition of the original source of the bulk of the collection. However, O'Reilly's catalogue appears to provide conclusive proof that the types of the great majority of those Gmelin species, based on the descriptions of insects by Zschach in *Museum Leskeanum*, reached Dublin and were extant in 1913.

W. F. Kirby, who joined the staff of the, by then, Royal Dublin Society in 1867 (Praeger, 1949 : 116; not 1865 as suggested by White, 1911 : 25), presented a paper in 1869 which dealt exclusively with the forgotten works of Gmelin and Zschach (strangely, he also makes no mention of O'Reilly), with the express purpose of generally drawing attention to them, and in particular to provide information about the butterflies (e.g. Pl. 3, fig. 9 shows Kirby's entry for *Papilio* 46c of Zschach). Kirby was an Assistant-naturalist for 12 years at Dublin, and in this paper he notes 'the remains of Leske's collection are in the Museum of the Royal Dublin Society, but the greater number of specimens have succumbed to the ravages of time and neglect'. Kirby lists 25 (correctly 24) butterflies as named by Gmelin, 23 of which were drawn from the 25 species described by Zschach (Kirby wrongly attributes *Papilio sectator* Meerburgh to Gmelin). At this time Kirby had evidently located type-material of some 16 of the latter. At the end of the paper he makes the following comment of general interest: 'I may add that Leske's collection was purchased for the Royal Dublin Society at the end of last century. The *Lepidoptera Heterocera* are all destroyed or seem unrecognisable. There are, however, a good many *Coleoptera*, &c., still in existence.'

While still at Dublin, Kirby produced his *Synonymic Catalogue of Diurnal Lepidoptera* (1871), and also his *Supplement* to this work (1877). Embodied in these are the results of his 1869 paper on the Gmelin names, and also a number of further discoveries or conclusions about this problem which he must have made between 1869 and 1877 (e.g. Pl. 5, figs 13-16, shows various entries concerning *Papilio* 46c). In no case is any further explanation given; as throughout the catalogue, the 'facts' are indicated by bold statement, the surmises or uncertainties by '?'. Shortly after leaving Dublin for London, Kirby (1880) published a catalogue of part of the Lepidoptera collections, as he had left them, at Dublin; strangely, despite the seemingly full treatment given to the butterflies, no mention is made of any Leske specimens or the Gmelin types. The now National Museum of Ireland possesses an interleaved copy of Zschach (1788), annotated in Kirby's handwriting (Pl. 5, figs 17, 18); as surmised above, Kirby evidently did do further work on the Leske material after 1869, the results being included in his catalogue, or its supplement, at various points.

Despite Kirby's hope of stimulating interest in Gmelin, this difficult area of the early literature has still received scant attention from entomologists, probably understandably. The great majority of Gmelin insect species must remain unidentifiable, except in the few instances where type-material may still exist (as it does with at least some of the species named from the Leske material). Probably the single major taxonomic problem, however, concerns primary homonymy; all the Gmelin names appear to have been noted by Sherborn (1902), in his *Index Animalium*, but other cataloguers have taken varying account of them, some ignoring them, others including them. Most curiously, Kirby himself, in his Orthoptera catalogues (published long after his days in Dublin), includes some but not all of the Gmelin species.

Those studying the butterflies have been relatively fortunate in this regard, due to the high proportion of types remaining, and the excellent work of Kirby. Even here, however, little cognisance of Kirby's work and how he was able to achieve his results seems to have been made by most workers, except occasional British entomologists. As an example of the former we may quote Weymer (1910 : 182, footnote), writing in 'Seitz':

'Whether *Antirrhea bifasciatus* Gmelin cited by KIRBY in his Catalogue really belongs to the genus *Antirrhea* or even to the American fauna, appears questionable, as it cannot be recognised from the description and the locality was not known to the author. The species is only designated as exotic, and hence may just as well belong to the Indian or African fauna. The original of the description was in the Museum Leskeanum, and no further example is known. According to this description . . . Habitat extra-European (GMELIN, Syst. Nat.)'.

Concerning *bifasciatus*, Kirby (1869 : 360) writes: 'One of the *Satyrinae*. A fragment of one of the types is still in existence; but I have not yet succeeded in identifying it.' Later (1871 : 642), in the Appendix to his catalogue, Kirby indicates that it is a species of *Antirrhea*, placing it after *A. taygetina* Butler. In the Dublin interleaved copy of Zschach (1788), opposite page 91, the following note in Kirby's handwriting appears: '59 P.P. Bifasciatus, Gmel. Syst. Nat. I. 5 p. 2290 n. 893. = Antirrhaea sp.' (Pl. 5, fig. 17).

Sadly, the 'fragment' of *bifasciatus* is no longer to be found in Dublin. However, a number of factors support the possibility that Kirby was right in his placement of this species. First, as will be evident from the list below, Kirby was essentially correct in all his firm identifications of Leskean/Gmelin types, where this has been confirmed by their continued existence. Secondly, where there was doubt about either the types or the placement of the species he always indicated it. Thirdly, the genus *Antirrhea* is a very characteristic S. American group; Kirby (1880 : 295) indicates that the Dublin Museum then possessed four species of *Antirrhea*, all of which are still present and were clearly correctly identified by him. Fourthly, Kirby did not just add the species to the genus, but placed it to follow a well defined species, suggesting that possibly he had been able to do more than just recognize it as a member of *Antirrhea*. Against this it is fair to say that the descriptions of Zschach and Gmelin do not fit any species of *Antirrhea* currently recognized; how-

ever, the majority of *Antirrhea* species are rare in collections, and at least three are still only known from uniques, quite apart from *bifasciatus* (Vane-Wright, unpublished). Thus while it is frustrating that the fragmented specimen which convinced Kirby to place *bifasciatus* in *Antirrhea* no longer exists, it would seem that Weymer did not have all the facts at his disposal, and that it may be more prudent to follow the excellent Kirby in this regard, leaving *bifasciatus* Gmelin as a species inquirenda of the genus *Antirrhea*.

As a result of examining the collections at the National Museum, Dublin, I am able to present a revised version of Kirby's 1869 paper, including a large number of further references, lectotype designations, and modern indications of classification. While this will not form the last word on the subject, I hope that it will settle the majority of outstanding problems concerning the Gmelin butterfly names, bringing together most of the relevant information, while also stimulating others to tackle at least the problems of primary homonymy caused by the Gmelin names in their respective groups.

GMELIN'S METHOD OF NUMBERING

Gmelin's numbering of *Papilio* species is bewildering at first sight, but actually is logical and rather neat. His system, which probably applies to all large genera and was doubtless evident to his contemporaries, is worth examining.

His first six species (pp. 2225-2226) are nos. 2, 274, 3, 275, 276, and 4. On page 2248 the numbers run 878, 351, 45, 44, and his final page 2370 carries nos. 875, 876, 268-271, 877, 272, 273. One number is misprinted: '550' for 558 (p. 2301). This reduces to three series of intercalated numbers: 1-273 (omitting 112, *P. enceladus*, an oversight?); 274-877 (omitting 345, 622); and 878-901 (omitting 884). The last series runs serially, but the first two are only approximately so. The first series starts with nos. 2-10, 1, 11-19, 25 . . . and ends with nos. 256-273 (no. 255 on p. 2287 lying between nos. 128-130, 239, 240, 501, 502, 242, 503, 504 and nos. 505-511, 262, 512-515, 885-893, 131).

Gmelin was revising Linnaeus (1767), where the genus *Papilio* included 273 species. To refer back, Gmelin simply used the Linnaean numbers, so his species 1-273 immediately equate with those of Linnaeus, and all except one bear the same names. Their sequence is varied to accord with his new classification requirements, and additions (the second and third series) are interpolated in their proper places. This economical method explains why Gmelin gave no other clarification when he substituted for no. 235 *P. pīrithous* Linnaeus, 1767, the replacement name *P. barbarus*, no. 235, on page 2352. No reason for replacing the perfectly valid Linnaean name is apparent, but it was probably in deference to Fabricius, whose junior homonym *P. pīrithous* Fabricius, 1775, for an entirely different species he had already cited on page 2281, no. 478. In any case *P. barbarus* Gmelin is clearly an invalid junior objective synonym of *P. pīrithous* Linnaeus, 1767.

Apart from that exception in Gmelin's first series there are only a few minor name changes. An interesting case is *P. ancaeus* Linnaeus, 1758 (and 1767, no. 184), which Gmelin (p. 2276, no. 184) notes had been misspelt *ancaea* by Cramer.

To make this abundantly clear he gives the Linnaean reference and number, which is also helpful because the preceding number is 113 and no. 114 is not found until the next opening, while nos. 183 and 185 do not appear until pp. 2320 and 2321. However, as will be seen later, the presence of no. 184 at this point probably caused a misnumbering in the final sequence.

Gmelin's second sequence, nos. 274-877, comprises all other names published to that date. All but two of these had been included in the latest definitive revision of the *Insecta*, by Fabricius (1787), and Gmelin gives references to that work for each species. Fabricius listed 834 species, but overlooked or merged some 38 of those recognized by Gmelin and Linnaeus, which accounts for most of the discrepancy between 834 and 877. The balance is due to the omission by Gmelin of three numbers (112, 345 and 622), and his inclusion of two further species: no. 355, *P. sectator* Meerburgh, 1775, and no. 601, *P. ceres* Fabricius, 1775.

The final 23 species, which comprise the series nos. 878-901 (omitting 884), were newly named by Gmelin, and are discussed below. The reason for the omission of no. 884 was perhaps that no. 883 came early in the *Danai candidi* on p. 2261, while the next group of the series was not reached until the end of the *Danai festivi* on p. 2289. While looking back to establish the number at the latter point, the number out of sequence to catch the eye was, as noted above, no. 184. Gmelin may have misread this as 884 and then proceeded with no. 885.

A NOTE ON SINGLE TYPE-SPECIMENS AND LECTOTYPE DESIGNATIONS

An ambiguity has arisen from certain wording in the *International Code of Zoological Nomenclature*, regarding the interpretation of holotypes and syntypes, and the necessity or otherwise of fixing lectotypes in certain instances. This concerns the situation where a species is described from an unstated number of specimens, with no original published designation of a specific 'type' or holotype, and where now only one original specimen is to be found. Some workers, perhaps a majority, regard such specimens as 'unique' types, and so treat them as holotype specimens. Dr Roger Crosskey has put forward an eloquent case in the hope of formalising this 'holotypist' approach; the reader is referred to the statement by Crosskey (1974 : 272) for details of the situation and his argument. However, the present author has always used the alternative interpretation: if there is no objective evidence in an original description as to whether the original type-series was multiple or not, then in such cases, even if only one original specimen can now be found, it requires eventual fixation as a lectotype. In the meantime such a specimen remains a type of indefinite status, or may be regarded as a lone syntype in a series of unknown size (which includes, of course, the implicit possibility that the original series did only consist of one specimen).

My interpretation of the *Code* is based on the operational principle that if it can be unequivocally inferred from the original description that there is a unique or 'type' specimen, then that specimen is the holotype, but in all other cases, to provide a specified unique type for the taxon concerned, a subsequent lectotype designation is necessary, even if only a single original specimen can now be found.

Crosskey (*op. cit.*) lists a number of objections to such a procedure, or at least to the designation of surviving unique specimens of the nature under discussion, as lectotypes. One objection is that other workers, seeing a lectotype to have been fixed, will expect at least one paralectotype to exist also. My use of the term lectotype is to indicate a clear fixation of a unique type-specimen to serve for nomenclatorial purposes, where no such fixation is explicit or implicit in the text of the original description concerned. In designating unique specimens of the sort under discussion as lectotypes, it should always be indicated that only the single specimen is known to exist, and that the size of the original series was quite unspecified.

Another point advanced by Crosskey is that, especially with older authors where most of these problems occur, it is rare to find more than one surviving type-specimen, suggesting that most old taxa were based on single specimens. This may be very true in a group like the Diptera, but it is a much less safe assumption with the Lepidoptera. Most of the taxa dealt with in this paper are of considerable antiquity. Analysis of the original descriptions of 56 species noted here reveals the following: only three have explicit holotypes; 38 are based on a completely undefined number of specimens; 11 are clearly based on series of more than one specimen, but the number of specimens is in no way indicated; and four are based on syntypic series with the included number of specimens being indicated. Of the 38 taxa with an undefined number of specimens in the original series, I have been unable to trace any type-specimens in 34.2 per cent. of cases, one specimen in 55.3 per cent. of cases, and two or more type-specimens in 10.5 per cent. of cases. Of the 11 species with unstated, but clearly multiple original series, I have been unable to find any type-specimens in 45.5 per cent. of cases, one specimen in 27.25 per cent. of cases, and more than one in 27.25 per cent. of cases. I think these figures show that in the case of butterflies, a large number of errors would be made if it were regularly assumed that a single surviving specimen indicated that the taxon in question was originally based on that specimen alone. With butterflies, the long history of private collectors, private loans, purchases, auctions, removal of labels, and even theft, has conspired to cloud the picture with uncertainty. In addition, some authors (e.g. Hans Fruhstorfer) are bemusing in their inconsistency with regard to their original publications, and the retrospective criteria now applied to decide type status. In this context, one need only think of the nightmare created by 'Seitz' for the conscientious museum worker concerned about applying the correct status to the types in his care.

In a final, and most significant argument, Crosskey claims that by designating a unique specimen as a lectotype, one is 'unnecessarily tying the hands of future zoologists', should other original specimens later be found to exist. Certainly, lectotype designations are final, if correctly made, but I believe that publishing accounts in which supposedly unique specimens are stated to be holotypes is operationally equally final. Such 'holotype designation' would always tend to be regarded as a 'previously valid type restriction' by subsequent workers. However, the whole question of restricting the freedom of future zoologists raises a more fundamental problem and division. The present author is a somewhat unwilling convert

to the 'lectotype designation cult'. My original viewpoint was that if a syntypic series existed, and if in the opinion of a subsequent worker all the syntypes applied to the same taxonomic grouping concept, then a lectotype designation served no useful function, but was indeed undesirable, since it *tied the hands of future zoologists*. Should such a series at a later date be deemed to be mixed (rare for butterflies, common for Diptera), then the zoologist concerned would be free to make the most appropriate choice in selecting a lectotype. However, I am now largely persuaded that, provided lectotype designations are not made casually (as for instance in type-catalogues, or figure legends, both frequent and regrettable practices), it is better that a taxonomist in doing work of a revisional nature should unequivocally fix definite, single type-specimens for all taxa in question, wherever possible, so as to reduce present and future uncertainty to a minimum. I am prepared to accept this in the current type-oriented approach to zoological nomenclature, since it seems inconsistent to advocate all new taxa to have fixed holotype specimens, yet wish to retain old type-series wherever possible as syntypic, 'just in case'. In fact, if we are seriously to consider flexibility for future zoologists, it would arguably be better to abandon the holotype concept altogether, and introduce an extended lectotype concept for use where necessary (this could include the neotype concept); but the present system has become far too well entrenched for the present author to have any great desire to see it changed.

Accepting the present system, and as an 'unwillingly converted lectotyper', I therefore regard the proposal advanced by Crosskey as neither fitting with one ideal nor the other. If lectotypes are to be designated as a matter of course where syntypic series exist, regardless of any doubt as to the conspecificity of the specimens, then in my opinion lectotypes should also be fixed for single extant specimens where there is no indication of unique status in the original description, provided this is done explicitly, and only in taxonomic treatments of an essentially revisional nature.

In conclusion to this discussion, I think it fair to say that in practice the two interpretations will nearly always lead to the same result. Rather than press for uniformity on a matter like this, I believe that it may be better not to tie the hands of *present* zoologists, allowing them the flexibility to apply whichever procedure seems the most sensible to them. What seems sensible in one group, and not so sensible in another, will depend largely on the history of collecting and museum techniques previously applied, and also on the nature of the particular organisms in question.

THE BUTTERFLIES NAMED BY GMELIN FROM *MUSEUM LESKEANUM*

The Gmelin butterflies named by reference to *Museum Leskeanum* are dealt with in their original order of presentation. For each, the presently accepted name is given centrally, in bold type, together with an indication of its family, followed by full species and important literary synonymy. Under a heading giving the original Gmelin name, there follows a brief taxonomic discussion in each case, with observations on the most likely type-locality, and including either a lectotype

or neotype designation where appropriate. In a number of instances lectotypes are also designated for synonymous taxa described by other authors.

The abbreviations listed below are used for depositories of type-material.

| | |
|------|--|
| BMNH | British Museum (Natural History), London, England. |
| CM | Carnegie Museum, Pittsburgh, U.S.A. |
| LC | Linnaean Collection, Linnean Society of London, England. |
| MLU | Museum Ludovica Ulrica, Uppsala, Sweden. |
| MNHN | Muséum national d'Histoire naturelle, Paris, France. |
| MNHU | Museum für Naturkunde der Humboldt-Universität, Berlin, D.D.R. |
| NMI | National Museum of Ireland, Dublin, Eire. |
| RNH | Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands. |
| RSM | Royal Scottish Museum, Edinburgh, Scotland. |
| USNM | National Museum of Natural History, Washington D.C., U.S.A. |
| ZI | Zoological Institute, Leningrad, U.S.S.R. |

Alcides orontes (Linnaeus) [Heterocera: Geometroidea, Uraniidae]

Papilio orontes Linnaeus, 1763a : 19. [AMBON] (MLU).

Papilio orontes Linnaeus, 1763b : 402. 'In India'.

Papilio orontes; Clerck, 1764 : pl. 26, fig. 1.

Papilio Equites Achivi sp., Zschach, 1788 : 87, no. 6*, pl. 2, fig. Glossata 6. 'Exoticus'.

Papilio argyrios Gmelin, 1790 : 2248., no. 878. 'Extra Europam' [? AMBON] (formerly in NMI; type-material destroyed). Synonymy by Kirby, 1892 : 16.

Papilio leskii O'Reilly, 1813 : 73, no. 6, nomen nudum. 'India'. [This name is objectively synonymous with *argyrios* Gmelin, being based on the same material.]

Alcides orontiaria Hübner, [1822] : pl. [218], figs 3, 4. [No locality.] (Type-material lost.)

Synonymy from Dalla Torre, 1924 : 6; correct date: Hemming, 1937b : 149.

Alcidis orontiaria Hübner, [1823] : 289. Correct date: Hemming, 1937b : 149.

Papilio argyrios Gmelin; Kirby, 1869 : 356.

Nyctalemon argyrios (Gmelin); Kirby, 1871 : 638.

Alcides orontes (Linnaeus); Kirby, 1880 : 335.

Alcidis orontes (Clerck); Kirby, 1892 : 16.

Papilio orontes Linnaeus; Sherborn, 1902 : 702.

Alcidis orontes (Clerck); Dalla Torre, 1924 : 6; Seitz, 1929 : 94.

Papilio argyrios Gmelin. I have been unable to trace any type-material in Dublin. Kirby (1880 : 335) lists one specimen of *Alcides orontes* Linnaeus, which is extant, but lacks data. It seems unlikely that this specimen was part of the Leske collection; curiously, no Leskean butterfly specimens are listed anywhere in Kirby's 1880 paper, and presumably the same would apply to this moth species. A good original figure is given by Zschach (1788 : pl. 2, fig. Glossata 6); the same plate is reproduced in Karsten (1789). The original most probably came from Ambon, and *argyrios* may thus be regarded as a strict synonym of *orontes* Linnaeus (Corbet, 1949 : 192-193, summarises information relevant to determining the type-locality of *orontes*).

Papilio leskii O'Reilly, noted in the synonymy above, is best regarded as a nomen nudum. If, however, it is treated as an available name, it falls as an objective synonym of *argyrios*.

Some confusion appears to exist in the literature concerning the authorship, date and even genus of *orontes* Linnaeus. The question of the spelling *Alcides*

v. *Alcidis* appears to have been settled finally by Hemming (1937b : 149), in favour of the former. The authorship and date problem is more vexed. A number of workers have attributed the name *orontes* to Clerck, 1759. It would appear, however, that these workers overlooked the division of Clerck's *Icones* into two parts; the title page of the second part, in which the original illustration of *orontes* appears, is dated 1764. The earliest dated work to mention *orontes* is the dissertation delivered by Boas Johansson in 1763, *Centuria Insectorum Rariorum* (Linnaeus, 1763a), which was also reprinted the same year in *Amoenitates Academicae* (Linnaeus, 1763b). It is considered normal to regard the authorship of new names in such dissertations as being that of Linnaeus, who was apparently responsible for most of the content of these works. Both these 1763 publications, however, make clear reference to 'Clerk t.26 f.1'; Higgins (1970) has suggested from other evidence that the component plates of Clerck's work may have been issued continuously, perhaps separately, from 1759 to 1764. It might therefore be correctly interpreted that Clerck had already published *orontes* prior to Johansson and Linnaeus. It would seem preferable, however, in the absence of proof to the contrary, to continue to regard the proper date of publication of the second part of Clerck's *Icones* as 1764; prior 'publication' probably consisted of private circulation of the separate plates, as they were completed, among friends and co-workers. It may also be noted that Hemming (1967 : 288, entry for *Metamandria*) was of the categorical opinion that all names published in Clerck's *Icones* should be attributed to Linnaeus.

I have followed Seitz (1929) with regard to the determination of these moth species, but any future reviser should carefully consider the type-material and original figures of *orontes*, *argyrios* and *orontiaria*.

***Pierella hyalinus hyalinus* (Gmelin) [Satyridae]**

(Pl. 6, fig. 19)

[*Papilio lena* Linnaeus; Cramer, [1780] : 5, pl. 291, figs A, B. 'Suriname'. Misidentification.]

Papilio parnassi sp., Zschach, 1788 : 88, no. 26*. 'Exoticus'.

Papilio hyalinus Gmelin, 1790 : 2259, no. 879. NEOTYPE ♂, SURINAM (BMNH), here designated [examined].

Papilio hyalinus; O'Reilly, 1813 : 74, no. 26. 'India'.

Papilio hyalinus Gmelin; Kirby, 1869 : 356; 1871 : 637.

Pierella hyalinus (Gmelin); Kirby, 1877 : 698; Kirby, 1880 : 295.

Pierella hyalinus hyalinus (Gmelin); Brown, 1948 : 63.

Papilio hyalinus Gmelin. No original type-material seems to have survived at Dublin, evidently having been destroyed sometime after 1813, and before Kirby's arrival in 1867. In the interleaved copy of Zschach at Dublin, Kirby first entered '? = *Antirrhoea philoctetes* L.'; subsequently he deleted this and wrote '= *Pierella dracontis*'. The most probable original type-locality for *hyalinus* is Surinam.

Kirby (1877 : 698) placed *dracontis* Hübner ([1819] : 53) as a junior synonym of *hyalinus*. Subsequently Brown (1948) has used these names, respectively, for the Amazon and Guyana region subspecies of *hyalinus* which he recognized.

Brown (op. cit.) gives good reasons for believing the type-locality of *hyalinus* to be Surinam. He also discusses the early confusion between *lena* Linnaeus and *hyalinus*, and the later application of the name *hyalinus* by other workers to insects from the Amazon and Trinidad. Brown indicates the illustration by Cramer (1780 : pl. 291, figs A, B) of a butterfly from Surinam (misidentified by Cramer as *lena*) to be the earliest description of this species as he interprets it; the specimen believed to have been illustrated by Cramer is now in the BMNH (see the general notes on Cramer, p. 55). Apart from the earlier confusion over species and subspecies names, Mr M. P. Clifton (unpublished work) is of the opinion that a complex of sibling species is involved in this group. In order to stabilize existing usage, the male specimen, believed to have been illustrated by Cramer as referred to above, is hereby designated neotype of *Papilio hyalinus* Gmelin. It bears the following labels: /Neotype/Surinam Coll. Lenep/Dracontis Hüb./H. Dracontis Hüb Lena Cramer/Felder Colln./Rothschild Bequest BM 1939-1/Papilio hyalinus Gmelin, det. R.I.V-W./, and is illustrated on Pl. 6, fig. 19.

In this context it may be interesting to note *Papilio sectator* Meerburgh (1775 : pl. 10, [83]). Kirby (1869 : 356) attributed this Meerburgh name (but not others) to Gmelin (1790 : 2250), perhaps assuming that Meerburgh had illustrated the species but not named it. Kirby (1871 : 642) later corrected this mistake, noting *sectator* Meerburgh as a junior synonym of true *Pierella lena* (Linnaeus).

Delias isse isse (Cramer) [Pieridae]

Papilio isse Cramer, 1775 : 87, pl. 55, figs E, F. 'Indes Orientales' [? AMBON] (type-material lost).

Papilio isse Cramer; Stoll, 1781 : 95, pl. 339, figs C, D. 'Amboina'.

Papilio Danai candidi sp., Zschach, 1788 : 88, no. 31*. 'Exoticus'.

Papilio bicolor Gmelin, 1790 : 2261, no. 880. LECTOTYPE ♂, 'extra Europam' [? AMBON]

(NML), here designated [examined]. Synonymy by Kirby, 1869 : 357.

Papilio bicolor; O'Reilly, 1813 : 74, no. 31. 'India'.

Pieris isse (Cramer); Kirby, 1869 : 357.

Delias isse (Cramer); Kirby, 1871 : 476; Kirby, 1880 : 321; Talbot, 1929 : 88.

Delias isse isse (Cramer); Talbot, 1937 : 473; D'Abbrera, 1971 : 148.

Papilio bicolor Gmelin. A single male specimen in Dublin bears the labels /31/Isse, Cram. (31) (Bicolor, Gmel, type specimen)/, the latter in Kirby's handwriting on blue paper; this specimen is hereby designated lectotype of *Papilio bicolor* Gmelin, and has been labelled accordingly. It lacks the antennae and abdomen, but is otherwise in fair condition. The lectotype fits the description given by Talbot (1937 : 473) for *Delias isse isse* (Cramer), known from Ambon, Ceram, Gisser and Banda. Both *isse* and *bicolor* were most probably obtained from Ambon.

Papilio isse Cramer. A male of this species in the BMNH, ex Felder collection, bears a 'Cramer label' (see p. 56) for *isse*. This specimen does not, however, correspond as closely to the original Cramer figure as two other ex Felder specimens which bear no other data. The BMNH does not appear to have the types of *Papilio*

crocalle or *P. celmus*, described on the same page as *isse*, all from specimens loaned to Cramer by B. Vriends of Haarlem (Cramer, 1775 : 87). It would appear possible that the 'Cramer label' was attached to a fresh specimen obtained at a later date. Stoll (1781) described the female of *isse* from one or more specimens collected on Ambon, in the collection of Baron Rengers. The BMNH collections include several female specimens of *isse*, ex Felder, which bear no further data. It is probable that some of these, and the males noted above, originated from the Rengers collection, or came from the same source.

***Delias ceneus ceneus* (Linnaeus) [Pieridae]**

Papilio ceneus Linnaeus, 1758 : 487. LECTOTYPE ♀, 'in Indiis' [AMBON] (MLU), here designated. Correct type-locality: Corbet, 1949 : 195.

[*Papilio hyparete* Linnaeus; Clerck, 1764 : pl. 38, two figures at lower margin. Misidentification.]

Papilio hyparete Linnaeus, varietas an Femina?; Linnaeus, 1764 : 247.

Papilio caeneus Linnaeus; Linnaeus, 1767 : 766.

[*Papilio hyparete* Linnaeus; Cramer, [1779] : 30, pl. 210, figs A, B. 'Amboina'. Misidentification.]

[*Papilio hyparete* Linnaeus; Stoll, [1781] : 95-6, pl. 339, figs E, F. 'Amboina'. Misidentification.]

Papilio Danai candidi sp., Zschach, 1788 : 88, no. 32.* 'Exoticus'.

Papilio discors Gmelin, 1790 : 2261, no. 881. LECTOTYPE ♂, 'extra Europam' [? AMBON] (NMI), here designated [examined]. Synonymy by Kirby, 1871 : 476.

[*Papilio antonoe* Cramer; Herbst, 1792 : 126, pl. 100, figs 1, 2, 3, 4. Misidentification.]

Papilio plexaris Donovan, 1805 : pl. 18, two figures. 'Botany Bay' [? AMBON] (type-material lost). Synonymy from Talbot, 1937 : 544.

Papilio discors; O'Reilly, 1813 : 74, no. 32. 'India'.

Pieris philyra Godart, 1819 : 150. LECTOTYPE ♀, [AMBON] (MLU), here designated. Synonymy from Talbot, 1937 : 544.

Cathaemia anthyparete Hübner, [1819] : 92. AMBON (type-material lost). Synonymy from Talbot, 1937 : 544.

Pieris discors (Gmelin); Kirby, 1869 : 357.

Delias caeneus (Linnaeus); Kirby, 1871 : 476; Kirby, 1880 : 321; Talbot, 1929 : 88.

Delias caeneus caeneus (Linnaeus); Talbot, 1937 : 543.

Delias ceneus ceneus (Linnaeus); Corbet, 1949 : 195.

Delias caeneus caeneus (Linnaeus); D'Abrera, 1971 : 150.

Papilio discors Gmelin. Two specimens, a pair, exist in the NMI collection; they appear above the drawer label /Types of Discors, Gmel./ . One specimen has no further data, while the other simply bears the addition /32/. The latter specimen, the male, is hereby designated lectotype of *Papilio discors* Gmelin, and has been labelled accordingly. The female (the 'altero sexu' of the original description) is similarly designated paralectotype; it lacks the abdomen. The lectotype is in fair condition, but as with most of the Leske material, is now very faded. Probably from Ambon, *discors* fits the description given by Talbot (1937 : 544), and is thus best treated as strictly synonymous with *ceneus ceneus* (Linnaeus). It is interesting to note that Zschach recognized the sexual dimorphism of this species.

Papilio ceneus Linnaeus. Corbet (1949 : 195) summarizes his work on the type-material of this species. I hereby designate the specimen in MLU as dealt

with by Corbet (loc. cit.) and illustrated by Clerck (1764 : pl. 38, two lowermost figures, as *Papilio hyparete*, in part), lectotype of *Papilio ceneus* Linnaeus.

Papilio plexaris Donovan was described from at least two male specimens from 'Botany Bay'. Donovan's natural history collection was auctioned by Stevens in 1818 (Horn & Kahle, 1935 : 60); the types are presumed to be lost.

Pieris philyra Godart was described by reference to Cramer's (1779), Stoll's (1781) and Herbst's (1792) figures of 'hyparete', and also, apparently, from material actually studied by Godart. In addition, Godart gives a first reference to '*Papilio Hyparete. Variet. an fem.? Linn. Mus. Lud. Ulv. p. 247.*'. As summarised by Corbet (1949), this last reference can be traced to the lectotype of *Papilio ceneus* Linnaeus, as designated above. To confirm existing synonymy, I hereby designate the lectotype specimen of *Papilio ceneus* Linnaeus as, additionally, the lectotype of *Pieris philyra* Godart, of which the latter thereby becomes an objective synonym. The specimens represented by the illustrations of Cramer (1779 : pl. 210, figs A, B), Stoll (1781 : pl. 339, figs E, F) and Herbst (1792 : pl. 101, figs 3, 4, 5) are designated paralectotypes. Of these it is interesting to note that while the figures of Cramer and Stoll, under the misidentified name *hyparete*, do actually refer to *ceneus* (= *philyra*), the figures of Herbst actually refer to true *hyparete* Linnaeus. Herbst did, however, illustrate *ceneus* on the previous plate (pl. 100, figs 1, 2, 3, 4), this time under the misidentified name *antonoe* Cramer. A pair of specimens in the MNHN have been recognized as paralectotypes of *Pieris philyra*, and labelled accordingly. A male *ceneus* in the Rothschild collection, BMNH, bearing the 'Cramer label' /No. 32. HYPARETE. Cr. III 210, A.B. & IV 339, C.D./, is probably a van Lennep specimen as referred to by Cramer (1779 : 30), but is evidently not the one figured by Cramer on plate 210, and has not therefore been designated as a paralectotype.

Cathaemia anthyparete Hübner was named by reference to 'Hyparete Cram. 210 A.B., & 339 E.F.'. The figures on plate 339 (Stoll, 1781) are from one or more female specimens received from Ambon by Baron Rengers (Stoll, op. cit.: 96); the material is apparently lost or unrecognizable.

The name *Papilio ceneus* Linnaeus might be regarded as a senior primary homonym of the name *Papilio cenea* Stoll, as published in 1790 in the *Supplement* to 'Cramer'. The name *cenea* Stoll is in current usage for the southern African subspecies of *Papilio dardanus* Brown. A large volume of very important genetical and other biological work has been done on the races of this polymorphic mimic species, and a strong case could be made out for conserving the junior homonym, *Papilio dardanus cenea* Stoll. Fortunately, as Charles Cowan has pointed out to me, Ceneus is a girl's name, while 'cenea' is not a Latin word but an arbitrary combination of letters. Therefore no question of homonymy arises, and both names can stand.

Delias dorimene (Stoll) [Pieridae]

Papilio dorimene Stoll, [1782] : 201, pl. 387, figs C, D. Holotype ♂, AMBON (type-material lost). Correct author and date: Hemming, 1958 : 43.

Papilio Danai candidi sp., Zschach, 1788 : 88, no. 34*. 'Exoticus'.

Papilio fuliginosus Gmelin, 1790 : 2261, no. 882. LECTOTYPE ♂, 'extra Europam' [? AMBON] (NMI), here designated [examined]. Synonymy by Kirby, 1869 : 357.

Papilio dorimene Cramer; Herbst, 1792 : 132, pl. 102, figs 6, 7.

Papilio fuliginosus; O'Reilly, 1813 : 74, no. 34. 'India'.

Pieris ageleis Godart, 1819 : 113, 147. AMBON (type-material lost). Synonymy from Talbot, 1937 : 447.

Pieris dorimene (Cramer); Kirby, 1869 : 357.

Delias dorimene (Cramer); Kirby, 1871 : 476.

Delias dorimene avenda Fruhstorfer, 1912b : 5. LECTOTYPE ♂, CERAM (BMNH), here designated [examined]. Synonymy from Talbot, 1937 : 447.

Delias dorimene (Cramer); Talbot, 1929 : 88; Talbot, 1937 : 447, 587; D'Abrera, 1971 : 146.

Papilio fuliginosus Gmelin. A single male specimen in Dublin bears the labels /34/ Type of Fuliginosus Gmel./; this specimen is hereby designated lectotype of *Papilio fuliginosus* Gmelin, and has been labelled accordingly. The specimen lacks the abdomen, but is otherwise in fair condition. The lectotype probably came from Ambon; it fits the description given by Talbot (1937), who did not recognize any subspecies of *dorimene*, which is found on the S. Moluccan islands of Ceram, Gisser, Saparua and Ambon. As also noted by Talbot (op. cit.: 587), *fuliginosus* (Gmelin) preoccupies *Delias fuliginosus* Kenrick, 1909.

Papilio dorimene Stoll was apparently described from a single male specimen, received from Ambon by Raye de Breukelerwaert. This specimen, the holotype, illustrated in Stoll's original figures, appears to be lost; no certain Stoll or Cramer specimens of this taxon exist in the Rothschild collection (BMNH), or in Leiden (RNH), where such might have been expected.

Pieris ageleis Godart was described by reference to the original description of 'Papillon dorimene Cramer', figures in Herbst (1792), and specimens examined by Godart himself. None of Godart's specimens can be traced in Paris or Edinburgh and, as noted above, the specimen illustrated by Stoll (1782 : pl. 201, figs C, D) is also apparently lost or destroyed.

Delias dorimene avenda Fruhstorfer was described from a pair of specimens in the Fruhstorfer collection from 'Ceram', the male collected by Ribbe, the female by Kühn. A single male now in the BMNH bears the labels /Type/Ceram Jllo C. Ribbe 1884/dorimene avenda Frhst [in Fruhstorfer's handwriting]/Fruhstorfer Coll BM 1937-285/; this specimen is hereby designated lectotype of *Delias dorimene avenda* Fruhstorfer, and has been labelled accordingly (type no. Rh 17308). A single female bearing the labels /Type/O. Ceram Fruhstorfer/avenda Fruhst. ♀ [in Talbot's handwriting]/Fruhstorfer Coll BM 1937-285/, is similarly designated paralectotype.

Eurema hecabe hecabe (Linnaeus) [Pieridae]

Papilio hecabe Linnaeus, 1758 : 470. LECTOTYPE ♀, 'in Asia' [CHINA: Canton] (LC), here designated [examined]. Correct type-locality: Corbet, 1941b; 1942; 1949.

Papilio Danaei candidi sp., Zschach, 1788 : 89, no. 35*. 'Exoticus'.

Papilio chrysopterus Gmelin, 1790 : 2261, no. 883. LECTOTYPE ♂, 'extra Europam' [? S. E. CHINA] (NMI), here designated [examined]. **Syn. n.**

Papilio chrysopterus; O'Reilly, 1813 : 74, no. 35. 'India'.

Papilio chrysopterus Gmelin; Kirby, 1869 : 357.

Eurema chrysopterus (Gmelin); Kirby, 1871 : 450.

Terias blanda acandra Fruhstorfer, 1910 : 169. Holotype ♀, HONG KONG (BMNH), [examined].

Joicey & Talbot, 1924 : 533; synonymy from Talbot, 1935 : 553.

Papilio chrysopterus Gmelin; Talbot, 1935 : 622.

Papilio hecabe Linnaeus; Corbet, 1941b : 27.

Eurema hecabe hecabe (Linnaeus); Corbet, 1949 : 494.

Papilio chrysopterus Gmelin. A single male specimen in Dublin bears the labels /Type of Chrysopterus, Gmel. [in Kirby's handwriting, on blue paper] /52 : 1925/ Examined by H. T. G. Watkins in 1925 and pronounced to be synonymous with *Terias hecabe hecabe* (Linné) from S. China. ♂/. This specimen is hereby designated lectotype of *Papilio chrysopterus* Gmelin, and has been labelled accordingly; although lacking both antennae, it is otherwise in fair condition.

H. T. G. Watkins, in collaboration with N. D. Riley, evidently closely compared the lectotype of *chrysopterus* with material of *hecabe* in the BMNH; a male *hecabe* from Hainan is labelled /*chrysopterus*, Gmel. compared with type 12.v.1925. N.D.R., H.W./, and a specimen from Macao, S. China, is similarly labelled /probably nearest to *hecabe* type/. All three specimens are virtually identical. However, the Hainan population is currently dealt with as a separate subspecies, *E. hecabe subdecorata* (Moore) (Corbet & Pendlebury, 1932 : 160). It would seem much more likely that Leske's material would have come from one of the trading ports on the China coast, than from the little known island of Hainan. The type-locality of *hecabe* has also been the subject of doubt. Corbet (1941b; 1942; 1945; 1949) has shown it to be Canton; I therefore propose to regard Canton as the type-locality of *chrysopterus* Gmelin, which thereby becomes a strict synonym of *Eurema hecabe hecabe* (Linnaeus).

Despite the fact that many of the Leske type-specimens evidently came from Ambon, in this case it is clear, from examination of specimens, that *chrysopterus* does not represent the race of *hecabe* from that island (*E. h. diversa* (Wallace)).

Papilio hecabe Linnaeus. Corbet has studied the type-material of this species in considerable detail. It remains only to provide a formal lectotype designation. I hereby designate the female specimen in the Linnaean Collection, London, which bears the labels /Hecabe 763/74. Hecabe/, as lectotype of *Papilio hecabe* Linnaeus. The lectotype is illustrated by Corbet & Pendlebury (1956 : pl. 29, fig. 6).

Euploea phaenareta phaenareta (Schaller) [Danaiidae]

Papilio sp., Seba, 1765 : 25, pl. 19, figs 13, 14.

[*Papilio midamus* Linnaeus; Cramer, [1780] : 131-2, pl. 266, figs A, B. 'Amboina'. Misidentification.]

Papilio phaenareta Schaller, 1785 : 177, pl. 5, figs 1, 2. [? AMBON] (type-material destroyed).

Papilio Danai festivi sp., Zschach, 1788 : 89, no. 46*. 'Exoticus'.

Papilio affinis Gmelin, 1790 : 2289, no. 885. LECTOTYPE ♀, 'extra Europam' [? AMBON] (NMI), here designated [examined]. Synonymy by Kirby, 1869 : 358. [Junior primary homonym of *Papilio affinis* Fabricius, 1775.]

[*Papilio midamus* Linnaeus; Herbst, 1793 : 12, pl. 119, figs 1, 2. Misidentification.]

Papilio affinis; O'Reilly, 1813 : 74, no. 46. 'India'.

Trepsichrois alea Hübner, 1816 : 16. AMBON (type-material lost). Synonymy from Bryk, 1937 : 370.

Danaïs prothoe Godart, 1819 : 177. LECTOTYPE ♂, AMBON (RSM), here designated [examined]. Synonymy from Grimshaw, 1898 : 2.

Euploea phaenareta (Schaller); Kirby, 1869 : 358.

?*Euploea affinis* (Gmelin); Kirby, 1871 : 17.

Euploea phaenareta (Schaller); Kirby, 1871 : 639.

Euploea phaenareta phaenareta (Schaller); Bryk, 1937 : 369; D'Abrera, 1971 : 190.

Papilio affinis Gmelin. A single female specimen in Dublin bears the label /46 Phaenareta, Schall. type of Affinis, Gmel./, in Kirby's handwriting. This specimen is hereby designated lectotype of *Papilio affinis* Gmelin, and has been labelled accordingly. This specimen which, apart from lacking the abdomen, is in fair condition, corresponds closely with material of the nominate subspecies of *Euploea phaenareta* from Ceram and Ambon (D'Abrera, 1971 : 190), probably coming, in fact, from the latter island. The 'sexus alter' of the original description appears to have been destroyed; no other specimens of *phaenareta* are now present in the NMI. The specific name *affinis* Gmelin is in any case invalid, being a junior primary homonym of *Papilio affinis* Fabricius.

Papilio phaenareta Schaller was described from at least one male specimen studied by Schaller, and by reference to female specimens illustrated by Seba (1765) and Cramer (1780), the last with some reservation. Schaller's material most probably came from Ambon, as with most other contemporary material from the Moluccas. The Schaller collection has been destroyed (Horn & Kahle, 1936 : 241).

Trepsichrois alea Hübner was described by reference to 'midamus Cram. 266. A.B.'. Cramer's material (1780 : 132, pl. 266, figs A, B) came from Ambon. An ex Felder specimen of *phaenareta* in the Rothschild collection (BMNH), which bears the 'Cramer label' /No. 62. MIDAMUS. Cr.III.266.A.B./ and a Felder /Coll. Lenep/ label, might be the specimen originally illustrated. However, I have compared this specimen with Cramer's original pattern plate, but find the finer details, especially on the underside, just too different to be confident of such an identification.

Danaïs prothoe Godart was described by reference to the misidentified illustrations of 'midamus' given by Cramer (1780) and Herbst (1793), in addition to one or more specimens studied by Godart himself. A single male specimen now in the RSM, ex Dufresne collection, bears the label /Amboine/ (Grimshaw, 1898 : 2). This specimen, which I have examined in Edinburgh, is hereby designated lectotype of *Danaïs prothoe* Godart.

***Danaus limniace exoticus* (Gmelin) stat. n., nom. rev. [Danaiidae]**

(Pl. 6, figs 21, 22)

Papilio Danaï festivi sp., Zschach, 1788 : 89, no. 46b*. 'Exoticus'.

Papilio exoticus Gmelin, 1790 : 2289, no. 886. LECTOTYPE ♂, 'extra Europam' [? CEYLON] (NMI), here designated [examined].

Papilio exoticus; O'Reilly, 1813 : 74, no. 46b. 'India'.

Danais leopardus Butler, 1866 : 52. LECTOTYPE ♂, INDIA (BMNH), here designated [examined]. **Syn. n.**

Danaus limniace (Cramer); Kirby, 1869 : 358.

?*Danus exotical* [sic] (Gmelin); Kirby, 1871 : 8.

Danaus limniace (Cramer); Kirby, 1871 : 639.

Danaida limniace mutina Fruhstorfer, 1910 : 204, pl. 78, row a. LECTOTYPE ♂, CEYLON (BMNH), here designated [examined]. **Syn. n.**

Danaus limniace leopardus (Butler); Talbot, 1943 : 134; Talbot, 1949 : 31.

Danaus limniace mutina (Fruhstorfer); Woodhouse, 1950 : 29.

Danais limniace (Cramer); Wynter-Blyth, 1951 : 67.

Danaus limniace leopardus (Butler); Bailey, 1951 : 74; Corbet & Pendlebury, 1956 : 440.

Papilio exoticus Gmelin. A single male specimen in Dublin bears the label /46b Zschach. Probably Leskean type of *P. exoticus* Gmel., in Kirby's handwriting, on blue paper. Despite Kirby's doubt, the original description by Zschach of the male scent organ ('*squama subtus*') of this species, makes it fairly certain that this specimen was part of the type-material of *exoticus*. This specimen is, therefore, hereby designated lectotype of *Papilio exoticus* Gmelin, and has been labelled accordingly. It is generally in fair condition, but lacks the head.

P. exoticus fits the diagnosis given by Talbot (1943 : 134) for *Danaus limniace leopardus* (Butler), and is very similar to many specimens in the BMNH of this subspecies, from Ceylon and India. It clearly does not belong to any of the other *limniace* subspecies enumerated by Talbot, both from examination of the BMNH collection, and study of Talbot's *Revisional Notes*. At the subspecies level this then places *leopardus* Butler and *mutina* Fruhstorfer in the synonymy of *exoticus*; lectotype designations for these taxa are appended below. It should be noted that the lectotypes of *exoticus* and *mutina* (Pl. 6, fig. 21) agree well with each other, and with the great majority of specimens from the Indian region dealt with by Talbot as *leopardus*. All three type-specimens of *leopardus* (Pl. 6, fig. 22), however, are atypical of the Indian subspecies, not showing any fusion of the fore wing posterior stripes or distal spot (Talbot, 1943), and thus not actually fitting Talbot's diagnosis for subspecies *leopardus*. However, the types appear to fall within the range of variation of the Indian subspecies, and so I am placing all three names, *exoticus*, *leopardus* and *mutina*, in synonymy. If further subdivision ever proves necessary, it would appear best to consider the lectotype of *exoticus* as being from Ceylon.

The name *limniace leopardus* (Butler) might have qualified for conservation under the reworded Article 23b of the *International Code* as advocated by Mayr et al. (1971), but this was rejected by the Zoological Congress held at Monaco. Further, as the type-specimens of *leopardus* are atypical of the Indian region subspecies, and the three most recent major books on Indian region butterflies use different names (Talbot, 1949; Woodhouse, 1950; Wynter-Blyth, 1951), it seems most straightforward to adhere to priority.

Danais leopardus Butler was described from three syntypic specimens, from 'India'. All three are extant in the BMNH, comprising one male and two females. The male bears the following labels: /Type [red]/N.India 43.10/Tirumala leopardus Butler Type/B.M.Type no Rh.6417 *Danais leopardus* ♂ Butl./. This specimen

is hereby designated lectotype of *Danaïs leopardus* Butler (Pl. 6, fig. 22), and has been labelled accordingly. The females, /Punjab 54.74/Type no.6418/ and /Moulmein 43.43/Type no.6419/ respectively, are similarly designated paralectotypes.

Danaïda limniace mutina Fruhstorfer was described from an unstated number of specimens, from 'Ceylon'. The BMNH possesses five males and four females from Ceylon which were received in the Fruhstorfer Danaid collection. One male bears the following labels: /Ceylon 1889 H.Fruhstorfer/Type [red; Fruhstorfer pattern]/limniace mutina Fruhst. [in Fruhstorfer's handwriting]/Fruhstorfer Coll. BM 1937-285/. This specimen is hereby designated lectotype of *Danaïda limniace mutina* Fruhstorfer (Pl. 6, fig. 21), and has been labelled accordingly (type no. Rh 17296). The remaining four males and four females are similarly designated paralectotypes (3♂, 3♀, /Ceylon 1889 H.Fruhstorfer'; 1♂, /Süd Ceylon Mai 1889 H. Fruhstorfer/; 1♀, Ceylon Schilling ex Coll. H. Fruhstorfer/).

***Danaus juvena claviger* (Gmelin) stat. n., nom. rev.** [Danaiidae]

(Pl. 6, fig. 20)

Papilio Danaï festivi sp., Zschach, 1788 : 89, no. 46c*. 'Exoticus'.

Papilio claviger Gmelin, 1790 : 2289, no. 887. LECTOTYPE ♂, 'extra Europam' [? AMBON] (NMI), here designated [examined].

Papilio claviger; O'Reilly, 1813 : 75, no. 46c. 'India'.

Danaïs meganire Godart, 1819 : 192. LECTOTYPE ♂, 'Java' [? AMBON] (MNHN), here designated [examined]. Synonymy originally given by Kirby, 1871 : 639.

Papilio claviger Gmelin; Kirby, 1869 : 358.

?*Danaus claviger* (Gmelin); Kirby, 1871 : 8.

Danaus claviger (Gmelin); Kirby, 1871 : 639; Kirby, 1877 : 691; Ribbe, 1889 : 218, 'Amboina und Ceram'; Röber, 1891 : 289, 'Ceram'.

Radena buruensis Holland, 1900 : 56. LECTOTYPE ♂, BURU (CM), here designated [photograph examined]. Synonymy with *meganire*: Talbot, 1943 : 144. **Syn. n.**

?*Danaïda juvena ogylla* Fruhstorfer, 1910 : 214. LECTOTYPE ♂, ARU (BMNH), here designated [examined]. Synonymized with *meganire* by D'Abrera, 1971 : 172.

Danaus juvena meganire (Godart); Bryk, 1937 : 167; Talbot, 1943 : 144; D'Abrera, 1971 : 172.

Papilio claviger Gmelin. A single male specimen in Dublin bears the labels /46c/Claviger, Gmel. Leskean type n.46c?/, in Kirby's handwriting. This specimen is hereby designated lectotype of *Papilio claviger* Gmelin, and has been labelled accordingly; it is in fair condition, but lacks the abdomen (a microscope slide of one foreleg has been prepared to check the sex.).

P. claviger fits very well with the material dealt with by Talbot (1943 : 144) as *Danaus juvena meganire* (Godart), from Buru, Ceram, Gisser, Nausa Laut and Ambon, probably coming from the last named island. There seems no doubt that *claviger* is the senior name for the race of *juvena* on this group of islands, as accepted by Ribbe (1889 : 218) and Röber (1891 : 289).

The original type-locality of *meganire* was given by Godart (1819 : 192) as Java: all subsequent treatments seem to follow Boisduval (1832 : 105) and Blanchard (1853 : 387-388) in attributing Godart's species to the S. Moluccas group of islands.

I have been able to confirm this by examination of the lectotype (Pl. 6, fig. 20), designated below, which probably came from Ambon.

D'Abrera (1971 : 172) has relegated the name *ogylla* Fruhstorfer, as dealt with by Talbot (1943 : 144), to the formal synonymy of *meganire* (= *claviger*). Material formerly in the Rothschild collection, evidently not examined either by Talbot or D'Abrera, does not help to make an easy decision on this; it does appear that *juventa* from the small islands between Ceram and Kai have a somewhat different appearance, as discussed by Talbot under *ogylla*, but probably the effect is a clinal one.

Danaïs meganire Godart was described from an unstated number of specimens, from 'Java'. A single male specimen in Paris bears the labels /Type/Meganira God. Indes orient. [yellow paper]/Museum de Paris/. This specimen is hereby designated lectotype of *Danaïs meganire* Godart (Pl. 6, fig. 20), and has been labelled accordingly. The lectotype lacks antennae and abdomen; in addition the fore legs are embedded in glue. The sex has been determined from the colour and scaling of the hind wing anal cells. A second male specimen in Paris which has the labels /Type/Indes orientales. Museum de Paris/, and the two specimens in the RSM, noted by Grimshaw (1898 : 2), are similarly designated paralectotypes.

Radena buruensis Holland was described from 15 examples collected on Buru by William Doherty. These specimens (six males, nine females) are all extant in the Carnegie Museum, Pittsburgh. One male, which bears the labels/Radena Bouruensis Holland n.sp./[in Holland's handwriting]/Bourou. Coll. Doherty/Holland Collection/, is hereby designated lectotype of *Radena buruensis* Holland, and has been labelled accordingly (by Dr Clench, on my behalf). I have examined a photograph of this specimen, kindly taken by Dr F. Martin Brown. The remaining 14 specimens are similarly designated paralectotypes.

Danaïda juventa ogylla Fruhstorfer was described from an unstated number of specimens from Aru. A single male in the BMNH bears the labels /Aru-Jnsel/Type/ogylla Fruhst. [in Fruhstorfer's handwriting]/ Fruhstorfer Coll. BM 1937-285/. This specimen is hereby designated lectotype of *Danaïda juventa ogylla* Fruhstorfer and has been labelled accordingly (type no. Rh 17304).

Taenaris urania urania (Linnaeus) [Amathusiidae]

Papilio urania Linnaeus, 1758 : 466. LECTOTYPE ♀, 'in Indiis' [AMBON] (MLU), here designated. Correct type-locality: Corbet, 1949 : 198.

[*Papilio cassiae* Linnaeus; Clerck, 1764 : pl. 29, fig. 3. Misidentification; identity with *urania* established by Corbet, 1941a : 15; Corbet, 1949 : 198.]

Papilio jairus Cramer, 1775 : 9, pl. 6, figs A, B. 'East Indies' [? AMBON] (specimen lost?).

Syn. n.

Papilio jairus Cramer; Cramer, [1777] : 134-135, pl. 185, figs A, B, C. 'Amboina'.

Papilio Danaï festivi sp., Zschach, 1788 : 89, no. 47*. 'Exoticus'.

Papilio marinus Gmelin, 1790 : 2289, no. 888. LECTOTYPE ♂, 'extra Europam' [? AMBON] (NMI), here designated [examined]. Synonymy by Kirby, 1869 : 358.

Oreas dubia Jaira Hübner, [1808] : pl. [84], figs 1, 2. [? AMBON] (specimen lost?). Correct date: Hemming, 1937a : 336, 403. [Junior secondary homonym of *jairus* (Cramer), 1775.]

Syn. n.

Papilio murinus [sic]; O'Reilly, 1813 : 75, no. 47. 'India'.

Tenaris nysa Hübner, [1819] : 53. Lectotype ♂, AMBON (BMNH), designated by Hemming, 1964 : 94 [examined: see below; see also Hemming, 1967 : 426]. Synonymy from Kirby, 1871 : 117.

Drusilla urania (Linnaeus); Kirby, 1869 : 358.

Tenaris urania (Linnaeus); Kirby, 1871 : 117; Kirby, 1880 : 300.

Tenaris nox Kirby, [1908] : 47 [new name for *Papilio jaira* Hübner]. **Syn. n.**

Taenaris urania urania (Linnaeus); Stichel, 1933 : 88.

Tenaris urania urania (Linnaeus); Brooks, 1950 : 232.

Taenaris urania urania (Linnaeus); D'Abrera, 1971 : 292. 'Ambon, Saparua'.

Papilio marinus Gmelin. A single male in Dublin bears the labels /47[?]/47 Urania ? type of Marinus, Gmel./, in Kirby's handwriting, on blue paper. This specimen is hereby designated lectotype of *Papilio marinus* Gmelin, and has been labelled accordingly. It is in fair condition.

Brooks (1950), in his revision of *Taenaris*, does not mention *marinus*, but in his arrangement of the BMNH Amathusiid collection he included it as a strict synonym of *urania*, the type-locality of which is now regarded as Ambon (Corbet, 1949). The three subspecies of *urania* currently recognized (Brooks, op. cit.; D'Abrera, 1971) are not, however, readily separable on the basis of single specimens, but it seems likely that all the old types, including that of *marinus*, came from Ambon. As noted by Kirby (1869 : 358) and also evidently by O'Reilly (1813 : 75), the name *marinus* is really a lapsus by Gmelin for *murinus*, which word is used in the original description. However, since the taxon in question is almost certainly relegated to permanent synonymy, the original spelling of Gmelin is best retained.

The names *jairus* Cramer, *nox* Kirby (= *jaira* Hübner) and *nysa* Hübner, listed in the synonymy above, have been dealt with for a long period in the literature as forms of *Taenaris urania urania* (Brooks, 1950; Hemming, 1964 : 123). However, all these names are available, having been proposed as full species, and as such should be listed in the synonymy of *urania* (L.). The present *International Code* does not apply to infrasubspecific terminology, but these names may still be applied to the dubious forms of *urania* (not, in my opinion, a truly polymorphic species) by those who may wish to do so. It should be noted that the name *duplex* Stichel, referred to by Brooks (1950 : 232) as a form of *urania urania*, correctly applies to *Taenaris urania pandemos* Fruhstorfer.

During this work I have recognized the lectotype-specimen of *Tenaris nysa* Hübner in the BMNH collections. Hemming (1964 : 94) made the original designation on the basis of a figure in Cramer (1777), without realising that some of the Cramer material was still in existence (as discussed elsewhere in this paper). The discovery of this lectotype-specimen is of special significance, *nysa* being the type-species of the genus *Taenaris* Hübner (Hemming, 1967 : 426).

Tenaris nysa Hübner. Lectotype designated by Hemming (1964 : 94) as the specimen represented by figure A on plate 185, in Cramer (1777). This specimen, a male, is now believed to be in the BMNH, and bears the labels /No. 94. JAIURUS. Cr. I. 6. AB. & II. 185. ABC/Felder Colln/Rothschild Bequest BM 1939-1/Tenaris nysa Hübner, Lectotype ♂, det. R.I.V.-W., 1972/BM Type No. Rh 17305/. The first label is a typical 'Cramer label'; Cramer (1777 : 135) notes the specimens illustrated as being from Ambon, in the collection of C. van Lennep.

Papilio urania Linnaeus. Corbet (1949: 198) summarizes his work on the type-material of this species. I hereby designate the specimen in MLU, as dealt with by Corbet (loc. cit.), and illustrated by Clerck (1764: pl. 29, fig. 3) under the name *Papilio cassiae*, lectotype of *Papilio urania* Linnaeus.

Papilio jairus Cramer was originally described from an unstated number of females, from the 'East Indies'. Those parts of the Cramer material which have not survived in the Felder collection or at Leiden are presumed to be lost. I have been unable to find any *urania* specimens of the distinctive nature of the specimen described as *jairus* by Cramer in the Felder material in the BMNH, and likewise no specimens of this form appear to survive in Leiden.

Oreas dubia jaira Hübner was based on one or more male specimens, as originally illustrated by Hübner. The locality was not indicated, and no published or manuscript text exists for the particular plate concerned (Hemming, 1937a; 1937b). The name *jaira* Hübner is invalid, being a secondary homonym of *jairus* Cramer; Kirby proposed the name *Tenaris nox* to replace it.

Euploea leucostictos leucostictos (Gmelin) [Danaiidae]

Papilio Danaï festivi sp., Zschach, 1788: 90, no. 48*. 'Exoticus'.

Papilio leucostictos Gmelin, 1790: 2289, no. 889. LECTOTYPE [♀], 'extra Europam' [AMBON] (NMI), here designated [examined]. Corbet, 1947: pl. 4, fig. 1.

Lemnas mutabilis Nemertes Hübner, [1807]: pl. [26], figs 3, 4; manuscript text, Hemming, 1937b: 102-104. [AMBON] (specimen lost). Synonymy by Kirby, 1869: 359; Corbet, 1947: 229.

Papilio leucostictos; O'Reilly, 1813: 75, no. 48. 'India'.

Euplaea aglidice Boisduval, 1832: 96. LECTOTYPE ♀, 'Rawack' [AMBON] (BMNH), here designated [examined]. **Syn. n.**

Euploea pasithea Felder & Felder, 1865: 318. LECTOTYPE ♂, AMBON (BMNH), here designated [examined]. Synonymy by Kirby, 1871: 13.

Euploea leucostictos (Gmelin); Kirby, 1869: 358; Kirby, 1871: 13; Kirby, 1880: 294.

Salpinx oculata Moore, 1883: 302. LECTOTYPE ♂, 'Mindanao' [AMBON] (BMNH), here designated [examined]. **Syn. n.**

Euploea leucostictos leucostictos (Gmelin); Corbet, 1947: 228, pl. 4, fig. 1. (Correct type-locality).

Euploea nemertes nemertes (Hübner); D'Abrera, 1971: 192.

Papilio leucostictos Gmelin. A single, composite, specimen in Dublin bears the labels /48/48 Leucostictos, Gmel. Type from Mus.Lesk./, the latter being in Kirby's handwriting on blue paper. This specimen (figured by Corbet, 1947: pl. 4, fig. 1) is hereby designated lectotype of *Papilio leucostictos* Gmelin, and has been labelled accordingly. The wings are those of a female insect, but the abdomen is male; the head is glued on upside down with two bristles affixed as antennae. The latter deception was noted by Corbet and clearly shows in his photograph. Corbet (op. cit.) also established the true type-locality of *leucostictos*, thereby correcting the erroneous locality of Java which had been attributed to this name for many years (e.g. Bryk, 1937: 392). As a result, the names *Lemnas nemertes* Hübner, *Euplaea aglidice* Boisduval, *Euploea pasithea* Felder & Felder and *Salpinx oculata* Moore

fall into the strict synonymy of *leucostictos* Gmelin. Lectotype designations for three of the synonymous species are appended.

Lemnas nemertes Hübner was described from an unstated number of male specimens, now lost. Hemming (1937a : 419, 429; 1937b : 102-104) deals with the previously unpublished manuscript text; the original material evidently came from Ambon.

Euplaea aglidice Boisduval was described from an unstated number of female specimens, from 'Rawack (terre de Papous)'. A single female in the BMNH bears the following labels: /Type/Typicum Specimen/Aglidice Boisduval Astrolabe - type/ Ex Musaeo Dr Boisduval/vu par Moore en 1881/Euplaea aglidice Bdv (astrolabe, page 96) ♀ Rawack (terre de Papous)/Euploea nemertes. ♀. Hubn./Ex Oberthür Coll BM 1927-3/. This specimen is hereby designated lectotype of *Euplaea aglidice* Boisduval, and has been labelled accordingly (type no. Rh 17297).

Euploea pasithea Felder & Felder was described from an unstated number of male and female specimens, from 'Amboina', collected by Doleschall and Lorquin. The BMNH possesses a single pair, the male of which bears the following labels: /Amboina Doleschall/Felder Colln/Type HT/pasithea/Rothschild Bequest BM 1939-1/. This specimen is hereby designated lectotype of *Euploea pasithea* Felder & Felder, and has been labelled accordingly (type no. Rh 17298). The female specimen bears the labels /Amboina Lorquin/Pasithea de Haan/Felder Colln/Type AT/Rothschild Bequest BM 1939-1/, and is similarly designated paralectotype.

Salpinx oculata Moore was described from an unstated number of male specimens, from 'Philippines (Mindanao)', in the British Museum. The BMNH now possesses a single male which bears the following labels: /Type/Mindanao, 'Challenger' 83-62/Salpinx oculata ♂ type Moore/BM type no. Rh 6768/. This specimen is hereby designated lectotype of *Salpinx oculata* Moore, and has been labelled accordingly.

Doleschallia hexophthalmos hexophthalmos (Gmelin) [Nymphalidae]

Papilio polibete Cramer; Cramer, [1779] : 73, pl. 235, figs C, D. Misidentification.]

Papilio Danai festivi sp., Zschach, 1788 : 90, no. 49*. 'Exoticus'.

Papilio hexophthalmos Gmelin, 1790 : 2289, no. 890. LECTOTYPE ♀, 'extra Europam' [? AMBON] (NMI), here designated [examined].

Papilio hexophthalmos; O'Reilly, 1813 : 75, no. 49. 'India'.

Papilio hexophthalmos Gmelin; Kirby, 1869 : 359.

Doleschallia hexophthalmos (Gmelin); Kirby, 1871 : 194.

Doleschallia amboinensis Staudinger, April 1885 : 104 [Feb. 1886], pl. 39 [Apr. 1885]. Holotype ♂, AMBON (MNHU). Synonymy by D'Abbrera, 1971 : 228.

Doleschallia crameri Distant, July 1885 : 41. AMBON (type-material lost). Synonymy by D'Abbrera, 1971 : 228.

Doleschallia hexophthalmos hexophthalmos (Gmelin); Fruhstorfer, 1912a : 561. 'Amboina'.

Doleschallia hexophthalmos hexophthalmos (Gmelin); D'Abbrera, 1971 : 228. 'Buru, Ambon, Serang, Saparua'.

Papilio hexophthalmos Gmelin. A single female specimen in Dublin bears the labels /49/Hexophthalmos, Gmel [49] type specimen Doleschall [ia] Hexophthalmos, Gmel . . . [o]verlooked for 70 years, . . . [u]nfigured/, the latter being a badly cut

label in Kirby's handwriting, on blue paper. This specimen, which is in moderate condition, is hereby designated lectotype of *Papilio hexophthalmos*, and has been labelled accordingly.

Fruhstorfer (1912 : 561) appears to have correctly interpreted Gmelin's species as an insect from Ambon; *hexophthalmos* is still regarded as a good species with a number of subspecies (D'Abrera, 1971 : 228). The classification of *Doleschallia* species is, however, perplexing (vide D'Abrera, op. cit.); anyone revising the group will have to pay particular attention to type-material, including that of *hexophthalmos*.

Doleschallia crameri Distant. Distant (1885 : 41) recognized that Cramer had confused two species under the name *polibete*, describing first the male of one species (Cramer, 1779 : 71, pl. 234, figs D, E), and then a female of another (op. cit. : 73, pl. 235, figs C, D). Distant restricted the 'type' of *polibete* to figs D, E on pl. 234, naming the insect illustrated on pl. 235, figs C, D, as *crameri*. In addition Distant referred to *crameri* material of both sexes collected on Ambon by Forbes. No *crameri* specimens attributable to either Cramer or Forbes are present in the Rothschild collection (BMNH), where they might have been expected.

Papilio polibete Cramer. As noted above, Distant restricted the usage of this name to the species dealt with by Cramer (1779) on pages 71-72 and pl. 234, figs D, E. The material concerned evidently came from Ambon; the name *polibete* is currently in use for the subspecies of *Doleschallia bisaltide* (Cramer) recognized from Ambon, Ceram and Saparua (D'Abrera, 1971 : 266). No original specimens are to be found in the Rothschild collection, or apparently in Leiden (RNH); they are presumed lost or destroyed. In the absence of type-material of either *crameri* or *polibete*, Distant's usage should be followed; it may eventually be necessary to designate neotypes for one or both names.

Zaretis itys (Cramer) [Charaxidae]

Papilio itys Cramer, [1777] : 34, 149 (*itus*), pl. 119, figs F, G. LECTOTYPE ♀, SURINAM (BMNH), here designated [examined].

Papilio isidora Cramer, [1779] : 72, pl. 235, figs A, B, E, F. 1 ♂, 1 ♀ syntypes, SURINAM (BMNH) [examined].

Papilio Danai festivi sp., Zschach, 1788 : 90, no. 55*. 'Exoticus'.

Papilio strigosus Gmelin : 2290, no. 891. LECTOTYPE ♀, 'extra Europam' [? SURINAM] (NMI), here designated [examined].

Papilio strigosus; O'Reilly, 1813 : 75, no. 55. 'India'.

Siderone itylus Westwood, 1850 : 321. Holotype ♂, BRAZIL: Rio de Janeiro (BMNH) [examined]. Authorship and date: Hemming, 1941 : 456.

Siderone zethus Westwood, 1850 : 321. Holotype ♂, BRAZIL: Para (BMNH) [examined]. Authorship and date: Hemming, 1941 : 463.

Siderone ellops Ménétrics, 1855 : 88, pl. 3, fig. 1. ♂, ♀ syntypes, NICARAGUA (ZI).

Siderone strigosa (Gmelin); Kirby, 1869 : 359, 1871 : 280. 'Para'.

Siderone isidora var. *strigosa* Staudinger, 1887 : 184, 185. BRAZIL: Rio de Janeiro to Rio Grande do Sul (MNHU). [Junior homonym of *Papilio strigosus* Gmelin, 1790.]

Siderone isidora var. *cacica* Staudinger, 1887 : 184. PERU: Chanchamayo (MNHU).

Zaretis isidora strigosa (Staudinger); Fruhstorfer, 1909 : 167. 'Sao Paulo to Sta. Catharina'.

Zaretis itys pseuditys Fruhstorfer, 1909 : 166. 2 ♂, 1 ♀ syntypes, BRAZIL: Espirito Santo (BMNH) [examined].

- Zaretis isidora anzuletta* Fruhstorfer, 1909 : 167. 1 ♂, 1 ♀ syntypes, MEXICO (BMNH) [examined].
- Zaretis isidora russeus* Fruhstorfer, 1909 : 167. 1 ♂ syntype, COLOMBIA (BMNH) [examined].
- Zaretis isidora vulpecula*, Fruhstorfer, 1909 : 167. 3 ♂, 1 ♀ syntypes, BRAZIL: Bahia (BMNH) [examined].
- Zaretis isidora leopoldina* Fruhstorfer, 1909 : 167. 1 ♂ syntype, BRAZIL: Espirito Santo (BMNH) [examined].
- Zaretis isidora vulpina* Fruhstorfer, 1909 : 167. 7 ♂, 1 ♀ syntypes, PARAGUAY (BMNH) [examined].
- Siderone strigosus* (Gmelin); Weeks, 1911 : xii. 'Venezuela: Suapure'.
- Zaretis isidora zethus* (Westwood); Röber, 1916 : 578. ('= *strigosus* Gmelin?; lower Amazon and Paraguay').
- Zaretis isidora strigosus* (Gmelin); Talbot, 1928 : 209. 'Mato Grosso'.
- Zaretis itys strigosus* (Gmelin); Stichel, 1939 : 726. 'Para'.
- Zaretis itys strigosa* (Staudinger); Stichel, 1939 : 726. (= *strigosus* Gmelin?; Rio de Janeiro').
- Anaea (Zaretis) itys* (Cramer); Comstock, 1961 : 30. (All available names carried in synonymy).

Papilio strigosus Gmelin. A single female specimen in Dublin bears the label /55 Strigosus, Gmel. type specimen/, in Kirby's handwriting, on blue paper. This specimen is hereby designated lectotype of *Papilio strigosus* Gmelin, and has been labelled accordingly. It is in rather poor condition, badly worn and variously repaired; one 'antenna' consists of a piece of bristle. As discussed below, this specimen most probably came from Surinam.

Comstock (1961), in his treatment of *Anaea* and allies followed, according to many workers, a very conservative line, demoting *Zaretis* to subgeneric rank. Further, while admitting evidence of subspeciation in *Zaretis itys*, he treated all available names applied to this species as synonymous, stating that 'with the present confused state of the literature and the unsatisfactory working material no attempt is made at the present time to assign the names properly' (Comstock, 1961 : 31).

Having examined the literature as pertaining just to the name *strigosus* Gmelin, I feel sympathy for Comstock's view. As can be seen from the synonymy presented above, the name *strigosa* or *strigosus* has been variously applied to material from Venezuela, Para, Mato Grosso and southern Brazil. Most confusingly, Staudinger (1887) named *strigosa* from South Brazil, evidently unsure whether his *strigosa* was the same as *strigosus* Gmelin or not. Clearly in this case *strigosa* Staudinger should be treated as an invalid homonym; the oldest valid name for such a subspecies, in any case, is *itylus* Westwood. This leaves *strigosus* Gmelin as a name most commonly applied to material of *itys* from the lower Amazon (Para). Having examined the lectotype, however, I see no reason why the name should not be applied to the Guyana/Surinam region, the most likely locality for the Leske material. The lectotype is perhaps closest in appearance to material of *itys* from Trinidad (in NMI and BMNH).

I refrain at this time from designating further lectotypes for the names pertaining to *itys*, as listed above in synonymy, with the exception of *itys* itself. It seems likely that Comstock's conservative approach will be superceded; Rydon (1971) has recently reinstated *Zaretis* to full generic rank. Those who may wish to rework the infraspecific and infrasubspecific taxonomy of *itys* will find further references in Stichel (1939) and Comstock (1961). In the course of any thorough revision,

the lectotype of *strigosus* Gmelin will have to be re-examined. If possible, however, I suspect that the best course will be to apply *strigosus* to a Surinam insect, thereby removing this confusing name from the classification by placing it in the strict synonymy of *itys* Cramer (assuming that only one species is involved in this complex). A lectotype designation for *itys*, the senior name, is appended.

Papilio itys Cramer was described from an unstated number of female specimens from Surinam. A single female in the Rothschild collection (BMNH) which bears the labels /Surinam Coll Lenep/Felder Colln/ compares closely with Cramer's original illustrations. This specimen is hereby designated lectotype of *Papilio itys* Cramer, and has been labelled accordingly (type no. Rh 17307).

Hypolimnas pandarus pandarus (Linnaeus) [Nymphalidae]

Papilio pandarus Linnaeus, 1758:461; Clerck, 1764: pl. 26, fig. 2. LECTOTYPE ♀, 'in Indiis' [AMBON] (MLU), here designated. Type-locality: see Corbet, 1941: 15; Corbet, 1949: 193, 197.

Papilio pipleis Linnaeus, 1758:476; Clerck, 1764: pl. 26, fig. 2. LECTOTYPE ♀, 'in Indiis' [AMBON] (MLU), here designated. Synonymy from Kirby, 1871: 225. Type-locality: see Corbet, 1941: 14; Corbet, 1949: 193, 197.

Papilio calisto Cramer, 1775: 37, pl. 24, figs A, B. LECTOTYPE ♂, 'Africa' [? AMBON] (BMNH), here designated [examined]. Synonymy from Kirby, 1871: 225.

Papilio pipleis Linnaeus; Cramer, 1775: 93, pl. 60, figs A, B. ['Amboina'; compared with *calisto*.]

Papilio Nymphales Gemmati sp., Zschach, 1788: 90, no. 58b*. 'Exoticus'.

Papilio lacteolus Gmelin, 1790: 2290, no. 892. LECTOTYPE ♀, 'extra Europam' [? AMBON] (NMI), here designated [examined]. Synonymy from Kirby, 1869: 359.

Papilio lacteolus; O'Reilly, 1813: 75, no. 58b. 'India'.

Diadema pandarus (Linnaeus); Kirby, 1869: 359.

Hypolimnas pandarus (Linnaeus); Kirby, 1871: 225. 'Amboina, Ceram'.

Hypolimnas pandarus pandarus (Linnaeus); Fruhstorfer, 1912a: 554. 'Amboina, Saparua, Ceram'.

Hypolimnas pandarus pandarus (Linnaeus); D'Abrera, 1971: 224.

[*Hypolimnas hewitsoni* (Wallace); D'Abrera, 1971: 224. Misidentification.]

Papilio lacteolus Gmelin. A single female in Dublin bears the labels /58b Pandarus. type of Lacteolus, Gmel./21. 5. 6. 79./, the former in Kirby's handwriting. This specimen is hereby designated lectotype of *Papilio lacteolus* Gmelin, and has been labelled accordingly. In quite good condition, the lectotype is very similar to the specimen erroneously illustrated by D'Abrera (1971: 225) as the female of '*Hypolimnas pandarus hewitsoni*', from 'Kai'. The latter is in fact a *pandarus* female from Ceram; an exactly similar form, however, occurs on Ambon, which seems the most likely type-locality for *lacteolus*. True *hewitsoni* (Wallace) is a subspecies of *H. deois* (Hewitson).

Corbet (1941; 1949) considered the Linnaean species *pandarus* and *pipleis* to be from Ambon. Corbet further considered both these names to be based on the same type-specimen, illustrated by Clerck (1764), and thus objectively synonymous. For completeness I append lectotype designations for these, to finally establish this synonymy, and for *calisto* Cramer, the remaining synonym.

Papilio pandarus Linnaeus. Corbet (1949 : 197) summarizes his work on the type-material of this species. I hereby designate the specimen in MLU, as dealt with by Corbet (loc. cit.) and illustrated by Clerck (1764 : pl. 26, fig. 2, as *Papilio pipleis*), lectotype of *Papilio pandarus* Linnaeus.

Papilio pipleis Linnaeus. Corbet (1949 : 197) summarizes his work on the type-material of this species. I hereby designate the specimen in MLU, as dealt with by Corbet (loc. cit.) and illustrated by Clerck (1764 : pl. 26, fig. 2), lectotype of *Papilio pipleis* Linnaeus, which is thereby finally established as an objective synonym of *pandarus* L.

Papilio calisto Cramer was described from an unstated number of specimens from 'Africa', in the collection of W. van der Meulen. The BMNH possesses a single male received in the Rothschild collection which corresponds well with Cramer's original illustration, and bears the following labels: /No. 40. CALISTO. Cr.I.24.A.B./Felder Colln/Rothschild Bequest BM 1939-1/. The former label is in the characteristic style believed to be associated with Cramer material. This specimen is hereby designated lectotype of *Papilio calisto* Cramer, and has been labelled accordingly (type no. Rh 17300).

Antirrhea bifasciatus (Gmelin) [Satyridae]

Papilio Nymphales Gemmati sp., Zschach, 1788 : 91, no. 59*. 'Exoticus.'

Papilio bifasciatus Gmelin, 1790 : 2290, no. 893. 'Extra Europam' [? SURINAM] (formerly in NMI, type-material destroyed).

Papilio bifasciatus; O'Reilly, 1813 : 75, no. 59. 'India'.

Papilio bifasciatus Gmelin; Kirby, 1869 : 359.

Antirrhæa bifasciatus (Gmelin); Kirby, 1871 : 642; Weymer, 1910 : 182 (footnote).

Papilio bifasciatus Gmelin. Kirby (1869 : 360) states of this species 'One of the Satyridæ. A fragment of one of the types is still in existence; but I have not yet succeeded in identifying it'. Two years later (Kirby, 1871 : 642) he placed *bifasciatus* in *Antirrhea*, to follow the well known species *taigetina* Butler. My searches in Dublin for the 'fragment' of the type proved fruitless; for the reasons discussed in detail in the Historical Review above (p. 24), I prefer to retain this name as a species inquirenda of the genus *Antirrhea*.

Papilio sulphitia Gmelin [?family]

Papilio Nymphales Phalerati sp., Zschach, 1788 : 92, no. 88*. 'Exoticus'.

Papilio sulphitia Gmelin, 1790 : 2336, no. 894. 'Extra Europam' (formerly in NMI, type-material destroyed). [Junior homonym of *Papilio sulphitia* Cramer, 1779, and *Papilio sulphitia* Stoll, 1780.]

Papilio sulphitia; O'Reilly, 1813 : 76. 'India'.

Papilio sulphitia Gmelin; Kirby, 1869 : 360; 1871 : 637; Sherborn, 1902 : 948.

Papilio sulphitia Gmelin. The type-material of this species was evidently destroyed sometime between 1813 and 1869. Kirby (1869 : 360) repeats the original Latin description; probably unrecognizable, this forgotten name is in any case invalid, being a junior primary homonym of both *Papilio sulphitia* Cramer and

P. sulphitia Stoll. Both the latter were, however, described within '*Papilio Nymphales Phalerati*', as was *sulphitia* Gmelin; the original description of Zschach (considerably shortened and modified by Gmelin) could apply to Cramer's species, the Chinese *Ladoga sulphitia*, but not to Stoll's *Metamorpha elissa* Hübner (= *sulphitia* Stoll), from South America. Conceivably Gmelin intended to refer to Cramer's original *sulphitia*, having perhaps identified Zschach's *Papilio* no. 88 with it. However, as Gmelin did not make any such reference, the name *sulphitia* Gmelin should be treated as suggested above.

***Papilio vidua* Gmelin** [?family]

Papilio Nymphales Phalerati sp., Zschach, 1788 : 92, no. 89*. 'Exoticus'.

Papilio vidua Gmelin, 1790 : 2336, no. 895. 'Extra Europam' (formerly in NMI, type-material destroyed). [Junior homonym of *Papilio vidua* Müller, 1764.]

Papilio vidua; O'Reilly, 1813 : 76, no. 89. 'India'.

Papilio vidua Gmelin; Kirby, 1869 : 360; 1871 : 637; Sherborn, 1902 : 1044.

Papilio vidua Gmelin. The type-material was evidently destroyed or lost between 1813 and 1869. Kirby (1869 : 360) repeats the original description; probably unrecognizable, this forgotten name is invalid, being a junior primary homonym of *Papilio vidua* Müller. In this case there is no question of Gmelin having failed to give a reference to the original name; *vidua* Müller and *vidua* Gmelin are unquestionably different, Müller's species being referable to the European Satyrid *Aphantopus hyperantus* (Linnaeus).

***Thecla cupentus* (Stoll) s. str.** [Lycaenidae]

Papilio cupentus Stoll, [1781] : 93, pl. 337, figs F, G. LECTOTYPE ♂, SURINAM (BMNH), here designated [examined]. Correct date and authorship: Hemming, 1958 : 43; Brown, 1941.

Papilio Plebeii Rurales sp., Zschach, 1788 : 93, no. 123*. 'Exoticus.'

Papilio annulatus Gmelin, 1790 : 2359, no. 896. LECTOTYPE ♂, 'extra Europam' [? SURINAM] (NMI), here designated [examined]. Synonymy by Draudt, 1920 : 769.

Papilio annulatus; O'Reilly, 1813 : 76, no. 123. 'Surinam'.

Papilio annulatus Gmelin; Kirby, 1869 : 361.

Thecla annulatus (Gmelin); Kirby, 1871 : 399.

Thecla cupentus (Cramer); Draudt, 1920 : 769; Comstock & Huntington, 1959 : 72.

Papilio annulatus Gmelin. A single male specimen in Dublin bears the labels /123/123 Annulatus, Gmel. type/, in Kirby's handwriting; this specimen is hereby designated lectotype of *Papilio annulatus* Gmelin, and has been labelled accordingly. The specimen is in rather poor condition, lacking antennae and large portions of the hind wings; the abdomen has now been dissected (preserved on separate 75 mm × 25 mm glass slide). The lectotype is evidently from the Surinam region; it is amusing to note that while Zschach and Gmelin gave their usual 'Exoticus' and 'extra Europam' respectively, O'Reilly forsook his usual 'India' for 'Surinam', this change, however, probably being accidental.

I am indebted to Dr H. K. Clench for much help and information concerning

this species. He has pointed out to me that *cupentus* must eventually be removed from the omnibus '*Thecla*', probably requiring the erection of a new genus to receive it. Further, he notes that the appearance of *cupentus* from the Guyana region is rather different compared with material from other areas in South America, perhaps indicating that this species will eventually be broken up into subspecies or siblings. To check this point Dr Clench sent me drawings of the male genitalia of a supposed *cupentus* from Colombia. I have compared this with dissections of the lectotypes of both *annulatus* and *cupentus*, finding all three to be in no way significantly different. I thus regard the latter two names as strictly synonymous, pertaining to material from the Guyana region (*cupentus* Stoll s. str.); the Colombian specimen would appear to represent, at most, only a separate subspecies. The lectotype designation for *cupentus* follows.

Papilio cupentus Stoll was described from an unstated number of male specimens from 'Suriname', apparently lent to Stoll by W. van der Meulen. A single male specimen in the BMNH now bears the following labels: /Surinam. Lenip/Felder Colln/Rothschild Bequest BM 1939-1/. As explained elsewhere, a number of apparent Cramer and Stoll specimens reached the Rothschild collection via van Lennep and Felder. I have compared this specimen with Stoll's published work, and the original paintings, with which it compares quite closely, allowing for some 'artistic licence' (as with all Cramer and Stoll illustrations, they are somewhat stylized). This specimen is hereby designated lectotype of *Papilio cupentus* Stoll, and has been labelled accordingly (type no. Rh 17301; slide no. Rh 11176).

Cupido oculus (Gmelin) [Lycaenidae]

Papilio Plebeii Rurales sp., Zschach, 1788 : 93, no. 131*. 'Eur'.

Papilio oculus Gmelin, 1790 : 2359, no. 897. 'In Europa' (formerly in NMI; type-material destroyed).

Papilio oculus; O'Reilly, 1813 : 77, no. 131. 'Europe'.

Papilio oculus Gmelin; Kirby, 1869 : 361.

Cupido oculus (Gmelin); Kirby, 1871 : 375.

Papilio oculus Gmelin. The type-material of this species was evidently lost or destroyed between 1813 and 1869. Kirby (1869 : 361) repeats the original description and indicates (under *lunulatus* Gmelin) that this species is a European Lycaenid, probably belonging either to the *arion*-group (*Maculinea* van Eecke) or *Polyommatus* Latreille. Two years later Kirby (1871 : 375) placed *oculus* in his omnibus treatment of *Cupido* Schrank (to include *Polyommatus*), near *arion* (L.). The name *oculus* seems subsequently to have been unused. It has never been recognised as pertaining to any known species. Despite Kirby's claim that it may prove possible to identify, no one has been able to do so yet.

Cupido lunulatus (Gmelin) [Lycaenidae]

Papilio Plebeii Rurales sp., Zschach, 1788 : 93, no. 132*. 'Eur'.

Papilio lunulatus Gmelin, 1790 : 2359, no. 898. 'In Europa' (formerly in NMI; type-material destroyed).

Papilio lunulatus; O'Reilly, 1813 : 76, 77, nos 130, 132. 'Europe'.

Papilio lunulatus Gmelin; Kirby, 1869 : 361.

Cupido lunulatus (Gmelin); Kirby, 1871 : 375.

Papilio lunulatus Gmelin. The type-material has evidently been destroyed. All comments applied to *Papilio oculatus* above apply equally to this species, but see also entry below (p. 54) for *Papilio Plebeii Rurales* sp., Zschach no. 130*.

***Jemadia hospita hephaestos* (Plötz) stat. n., nom. rev. [Hesperiidae]**

(Pl. 6, fig. 24)

Papilio Plebeii Urbicolae sp., Zschach, 1788 : 94, no. 154*. 'Exoticus'.

Papilio aethiops Gmelin, 1790 : 2360, no. 899. LECTOTYPE ♂, 'extra Europam' [? SURINAM] (NMI), here designated [examined]. Incorrectly synonymized with *Jemadia menechmus* (Mabille) by Evans, 1951 : 52. [Junior homonym of *Papilio aethiops* Esper, 1779.]
Syn. n.

Papilio aethiops; O'Reilly, 1813 : 77, no. 154. 'Africa'.

Papilio aethiops Gmelin; Kirby, 1869 : 361.

? *Pyrrhopyge aethiops* (Gmelin); Kirby, 1871 : 587.

Pyrrhopyga hephaestos Plötz (Möschler in litt.), 1879 : 521. Holotype ♀, SURINAM [: Paramaribo] (MNHU, Berlin) [examined].

Pyrrhopyge hephaestus Möschler, 1883 : 324. Holotype ♀, SURINAM: Paramaribo (MNHU) [examined]. Based on the same type-specimen, the name *hephaestus* Möschler is an objective synonym of *hephaestos* Plötz.

? *Pyrrhopyge aethiops* (Gmelin); Mabille, 1912 : 7.

[*Jemadia hospita ulixes* (Plötz); Evans, 1915 : 51. Misidentification.]

Papilio aethiops Gmelin; Evans, 1951 : 52 (primary homonym of *aethiops* Esper). [Incorrectly placed as a synonym of *Jemadia menechmus* (Mabille).]

Papilio aethiops Gmelin. A single male specimen in Dublin bears the label /154 Aethiops, Gmel. Type specimen/, in Kirby's handwriting; this specimen is hereby designated lectotype of *Papilio aethiops* Gmelin, and has been labelled accordingly. It is in rather poor condition. The abdomen has been dissected and is now preserved on a separate 75 mm × 25 mm glass slide. The type-locality of *aethiops* Gmelin is almost certainly Surinam (O'Reilly was misled by the name). However, although the few specimens in the BMNH which correspond to *aethiops*, as dealt with by Evans (1951 : 51) under *Jemadia hospita ulixes*, mostly bear the designation 'Surinam', all are very old, 18th century, as is the type of *aethiops*. The name *aethiops* Gmelin is an invalid homonym; the only suitable replacement that I have been able to find is *hephaestos* Plötz. However, it is with some doubt that I here refer the 18th century *aethiops* Gmelin material to the latter name, which is based on a 19th century specimen (Pl. 6, fig. 24) and does not correspond precisely with true *aethiops*, or any other material that I have seen. The type of *hephaestos* is, unfortunately, a female; it may eventually prove necessary, or the better course, to propose a new name for *aethiops* Gmelin. The species requires the acquisition of fresh material and careful re-examination.

The following notes on the synonymies of *Jemadia menechmus*, *J. hospita* and *J. hewitsonii* stem from examining Evans' (1951) work with respect to the synonymy of *aethiops* Gmelin.

Jemadia menechmus (Mabille) [Hesperiidae]

Evans (1951 : 52) identified *aethiops* Gmelin with this name. As shown above, *aethiops* pertains to *J. hospita* (Butler), and should be removed from the synonymy of *menechmus*.

Jemadia hospita hospita (Butler) [Hesperiidae]

(Pl. 6, fig. 23)

Pyrrhopyga hospita Butler, 1877 : 128. LECTOTYPE ♂, PERU: Ucayali (BMNH), here designated [examined].

Pyrrhopyga ulixes Plötz, 1879 : 521. LECTOTYPE ♂, 'Suriname' [? true locality] (MNHU), here designated [examined]. **Syn. n.**

Evans (1951 : 51) dealt with material attributable to true *aethiops* Gmelin as subspecies *J. hospita ulixes* (Plötz). However, examination of the *ulixes* type (Pl. 6, fig. 23) shows it to be very similar to *hospita* Butler; it seems possible that it came from the upper Amazon region rather than Surinam as originally indicated.

Pyrrhopyga hospita Butler was described from 'several examples' collected at Ucayali, Peru, by Walter Davis. A single male specimen now remains in the BMNH and bears the labels /Type H.48/Peru. W. Davis. 77-52/P. *hospita* Butler Type/; this specimen is hereby designated lectotype of *Pyrrhopyga hospita* Butler and has been labelled accordingly (type no. Rh 17306).

Pyrrhopyga ulixes Plötz was described from an unstated number of specimens from 'Surinam'. A single male specimen in the MNHU bears the labels /Type/ Surinam Volikman/Ulixes Plötz*/Ulixes Plötz Stett.Ent.Zeit. 1879, p.521/4931/9 : 16/, and is hereby designated lectotype of *Pyrrhopyga ulixes* Plötz (Pl. 6, fig. 23); it has been labelled accordingly.

Jemadia hewitsonii brevipennis Schaus [Hesperiidae]

Jemadia brevipennis Schaus, 1902 : 425. Holotype, BRAZIL: São Paulo (USNM), type no. 5962.

? *Jemadia lisetta* Mabille & Boulet, 1908 : 195, 197. 1 ♂ syntype, PERU (MNHN), [examined]. Incorrectly synonymized with *J. hospita ulixes* by Evans, 1951 : 51.

Jemadia hewitsonii brevipennis Schaus; Evans, 1951 : 54. 'Bolivia, Mato Grosso, Sao Paulo'.

As noted above, Evans (1951 : 51) dealt with true *aethiops* Gmelin as *J. hospita ulixes*, to which he also attributed *lisetta* Mabille & Boulet. The latter was described from three males in the Boulet collection from Peru and another male in the Mabille collection, from Bolivia. Evans effectively claimed to have identified the latter specimen in the BMNH collections, noting that it was labelled '*lisetta*' by Mabille, had no locality data, and was probably from Surinam. This specimen he regarded as the 'type', and it formed the basis of his synonymy. However, Mabille named a considerable amount of material in the BMNH collections, often inaccurately. I do not consider there to be sufficient evidence to regard this specimen as the 'Bolivian' example noted in the original description. I have examined one of the

syntypic Peru males (Pl. 6, fig. 25) of the Boulet collection, now in the MNHN, and find it to be extremely similar to *J. hewitsonii brevipennis* Schaus, as dealt with by Evans (1951 : 54). This, however, is rather surprising, since one might expect *hewitsonii* material from Peru to fit the nominotypical subspecies. A cursory examination of *hewitsonii* material as dealt with by Evans suggests that it is possible that two species, with overlapping ranges may be involved; the whole *hewitsonii* complex needs careful re-examination, as indeed, does the whole species taxonomy of *Jemadia*, Evans' account seemingly being inadequate in a number of ways.

Autochton bipunctatus (Gmelin) [Hesperiidae]

(Pl. 6, fig. 26)

Papilio Plebeii Urbicolae sp., Zschach, 1788 : 94, no. 160*. 'Exoticus'.

Papilio bipunctatus Gmelin, 1790 : 2360, no. 900. NEOTYPE ♂, FRENCH GUIANA (BMNH), here designated [examined].

Papilio bipunctatus; O'Reilly, 1813 : 77, no. 160. 'India'.

Papilio bipunctatus Gmelin; Kirby, 1869 : 362.

Thymele bipunctatus (Gmelin); Kirby, 1871 : 572. *Cecrops neis* Geyer given as a synonym.

Cecropterus bipunctatus (Gmelin); Möschler, 1877 : 344; Kirby, 1880 : 329.

Cecropterus neis (Geyer); Plötz, 1882 : 261. 'Laguayra'; *bipunctatus* given as a synonym of *neis*.

Cecropterus orontes Plötz, 1882 : 261. VENEZUELA: La Guaira (type-material lost). Synonymy by Evans, 1952 : 125.

Cecropterus bipunctatus (Gmelin); Mabille, 1883 : lv. As separate species from *neis*.

Cecropterus zonilis Mabille, 1883 : lvi. LECTOTYPE ♂, COLOMBIA (BMNH), here designated [examined]. Synonymy from Evans, 1952 : 125.

Cecropterus bipunctatus (Gmelin); Watson, 1893 : 32.

Cecropterus neis (Geyer); Godman & Salvin, 1894 : 328. *C. bipunctatus* (Gmelin) given as a doubtful synonym.

Cecropterus bipunctatus (Gmelin); Mabille, 1903 : 29; Kaye, 1904 : 211.

Cecropterus bipunctatus (Gmelin); Draudt, 1922 : 870. ? Misidentification according to Evans, 1952 : 125.

Autochton bipunctatus (Gmelin); Evans, 1952 : 125.

Cecropterus bipunctatus (Gmelin); Barcant, 1970 : 298.

Papilio bipunctatus Gmelin. The specimen of *bipunctatus* studied by Kirby (1869 : 362; 1871 : 572) is no longer to be found in Dublin. Kirby (1880 : 329) lists one specimen of this species, but as usual this does not refer to type-material (see discussion of *Papilio argyrios*, p. 29). Assuming Kirby (1871) to be essentially correct in his treatment of this species, *bipunctatus* Gmelin may be regarded as a species of the group now dealt with as *Autochton* Hübner; the most likely type-locality for *bipunctatus* would have been Surinam.

Kirby (1871) gave *bipunctatus* as a senior synonym of *Cecrops neis* Geyer. Mabille appears to have been the first to use both of these names for supposedly distinct species. Draudt (1922), according to Evans (1952), 'misidentified' *bipunctatus*, probably dealing with the species *longipennis* Plötz under that name. Very probably many of the authors dealing with *bipunctatus* as a separate species have variously misidentified it in Evans' sense. Evans (1952), while dealing with *neis* and *longi-*

pennis as separate species, treats *bipunctatus* as the senior synonym for *orontes* Plötz and *zonilis* Mabille. Barcant (1970) lists *bipunctatus* in the sense of Kaye (1904).

The need for a primary type-specimen for *Papilio bipunctatus* Gmelin is apparent. To satisfy this requirement in a manner which least upsets existing usage, one of the male specimens studied by Evans (1952 : 125) from French Guiana, is here designated neotype of *Papilio bipunctatus* Gmelin. This specimen, in the BMNH, bears the labels /Guyane Française Collection C. Bar/R.Oberthür Coll. BM 1931-136/Papilio bipunctatus Gmelin, Neotype ♂ det. R.I.V.-W. 1974./. This neotype is illustrated on Pl. 6, fig. 26.

Cecropterus orontes Plötz. I have been unable to locate any type-material of this name. Apparently no type-specimens exist in Berlin, where they might have been expected; possibly the original material is destroyed.

Cecropterus zonilis Mabille was described from an unstated number of specimens of unstated sex, from 'Columbia'. A single male now in the BMNH bears the labels /Colombia/zonilis Mb. orontes Pl./type/Ex Oberthür Coll. BM 1927-3/. This specimen, referred to by Evans (1952 : 125) as the 'type', is hereby designated lectotype of *Cecropterus zonilis* Mabille, and has been labelled accordingly (type no. Rh 17302). A further pair of specimens, possibly part of the original series, are not designated paralectotypes at this time.

Ablepsis fenestratus (Gmelin) [Hesperiidae]

(Pl. 6, fig. 27)

Papilio Plebeii Urbicolae sp., Zschach, 1788 : 95, no. 161*. 'Exoticus'.

Papilio fenestratus Gmelin, 1790 : 2360, no. 901. NEOTYPE ♂, FRENCH GUIANA: Nouveau Chantier (MNHN), here designated [examined].

Papilio fenestratus; O'Reilly, 1813 : 77, no. 161. 'India'.

Papilio fenestratus Gmelin; Kirby, 1869 : 362.

Plesioneura fenestratus (Gmelin); Kirby, 1871 : 621.

Telemiades acutipennis Mabille & Boulet, 1912 : 120. Holotype ♂, FRENCH GUIANA: Nouveau Chantier (MNHN) [examined]. [Synonymy originally from Evans, 1952 : 162; becomes objective synonym of *fenestratus* as result of action taken here.]

Papilio fenestratus Gmelin; Evans, 1949 : 477.

Ablepsis fenestratus (Gmelin); Evans, 1952 : 162.

Papilio fenestratus Gmelin. The original type-material has been destroyed. Kirby (1869 : 362) states that the type was then still in existence, but so broken that there was little chance of identification. Two years later, however, he placed it in *Plesioneura* (Kirby, 1871 : 621). Evans (1949 : 477) was unable to fit the original description of *fenestratus* to any true *Plesioneura* known, or any of the other Old World species then under review, but noted it to be in accord with the S. American *Telemiades acutipennis* Mabille & Boulet. Evans also noted that the type of *fenestratus* was no longer in existence, which I am able to confirm after studying the collection at Dublin. Evans (1952 : 162) finally placed *fenestratus* in *Ablepsis*, with *acutipennis* as a synonym. Evans studied only a single male, in the BMNH from French Guiana, and which I have closely compared with the

holotype of *acutipennis* (Pl. 6, fig. 27). I can confirm Evans' identification, and to stabilise existing usage, I here designate the holotype of *Telemiades acutipennis* Mabilite & Boulet as additionally the neotype of *Papilio fenestratus* Gmelin. This male specimen, now in the MNHN, bears the data label /French Guiana, Nouveau Chantier, E. le Lout/, and is illustrated on Pl. 6, fig. 27.

REPLACEMENT NAMES PROPOSED BY GMELIN

Syntarucus pirithous (Linnaeus) [Lycaenidae]

Papilio pirithous Linnaeus, 1767 : 790, no. 235. ALGERIA (type-material lost?).

Papilio philiasus Linnaeus, 1767 : 790, no. 233. ALGERIA (type-material lost?). Synonymy by Kirby, 1871 : 351.

Papilio telicanus Lang, 1789 : 47. FRANCE: southern (depository of type-material unknown). Synonymy by Higgins & Riley, 1970 : 251.

Papilio barbarus Gmelin, 1790 : 2352, no. 235. [Proposed as a replacement name for *Papilio pirithous* Linnaeus, 1767.]

Papilio barbarus Gmelin. As already shown (p. 25), Gmelin's number 235 was a reference to that of Linnaeus, and this name is an invalid replacement for *pirithous* Linnaeus, 1767.

Kirby (1870 : 149, 150) tentatively synonymized *P. pirithous* and *P. philiasus* as the male and female of the same species, adding that the latter might also be conspecific with *P. amyntas* Fabricius. A year later Kirby (1871 : 351) confirmed the synonymy of *P. philiasus*, *P. pirithous* and *P. barbarus* and acted as first reviser in giving priority to the first over the second. At the same time he moved *P. amyntas* Fabricius to the synonymy of another species (p. 356). Finally, citing the same reference, he placed it as a Hesperiid (p. 605). By a coincidence, the true *P. amyntas* Fabricius (also a junior homonym) features under the next species below. Strong support for Kirby's synonymy of *P. philiasus* and *P. pirithous* as sexual dimorphs can be drawn from their original descriptions, in which for both Linnaeus wrote 'Habitat Algeriae, Brunniche'. Martin T. Brännich (1737-1827) of Copenhagen was a correspondent of Linnaeus. He probably 'communicated' the descriptions, and his insects were probably captured flying together.

As far as can be judged at present, *Syntarucus pirithous* (Linnaeus) has as subjective synonyms *Papilio philiasus* Linnaeus and *Papilio telicanus* Lang, with *Papilio barbarus* Gmelin an objective synonym. However, no type-material has been traced, and further research is desirable. Staudinger & Rebel (1901 : 76, no. 530 and n) provisionally linked the first three names.

Polygonus leo leo (Gmelin) [Hesperiidae]

Papilio amyntas Fabricius, 1775 : 533, no. 384. 'In America' (2 specimens in Kiel; see Zimsen, 1964 : 518). [Homonym of *Papilio amyntas* Poda, 1761.]

Papilio leo Gmelin, 1790 : 2363, no. 836. [Proposed as replacement name for *Papilio amyntas* Fabricius, 1775.]

Polygonus leo leo (Gmelin); Evans, 1952 : 54.

Gmelin evidently noted the homonymy of *Papilio amyntas* Fabricius, and proposed *leo* as a new name for it. The reader is referred to Evans (1952 : 54) for the full synonymy of this neotropical skipper. Gmelin also noted the name *Papilio phocus* Cramer, 1777, as a possible synonym. *P. phocus* is now regarded as a valid species, being the type-species of the genus *Nascus* Watson.

***Perichares philetes philetes* (Gmelin) [Hesperiidae]**

Papilio coridon Fabricius, 1775 : 533, no. 385. 'In Iamaica' [JAMAICA] (2 specimens in Glasgow; see Zimsen, 1964 : 518). [Homonym of *Papilio coridon* Poda, 1761.]

Papilio philetes Gmelin, 1790 : 2364, no. 842. [Proposed as replacement name for *Papilio coridon* Fabricius, 1775.]

Perichares philetes philetes (Gmelin); Evans, 1955 : 255.

Gmelin evidently noted the homonymy of *Papilio coridon* Fabricius, and put forward the name *philetes* as a replacement. Gmelin also included the name *Papilio talus* Cramer, 1777, with this species, but *talus* is now regarded as a valid species of the genus *Astraptus* Hübner. *Papilio coridon* Fabricius is the type-species of the genus *Perichares* Scudder. Hemming (1967 : 352) states that *philetes* Gmelin is the oldest valid name 'subjectively applicable to the type-species of this genus'. In my opinion, *philetes* was proposed as a replacement name, and is therefore objectively applicable to the type-species of *Perichares*.

BUTTERFLIES DESCRIBED IN *MUSEUM LESKEANUM* BUT NOT NAMED
BY GMELIN AS NEW SPECIES

? ***Jamides celeno* (Cramer) [Lycaenidae]**

Papilio Plebeii Rurales sp., Zschach, 1788 : 93, no. 122 (? *celerio* [sic]). 'Exoticus'.

? *Papilio celeno* Cramer; Gmelin, 1790 : 2339, no. 705. 'Surinamo'.

Papilio celerio [sic]; O'Reilly, 1813 : 76, no. 122. 'Surinam'.

Papilio sp. no. 122, *Museum Leskeanum*. Zschach, in his description, cryptically indicates that this species may be *Papilio 'celerio'* (after Fabricius), correctly *celeno* Cramer (1775 : 51, pl. 31, figs C, D), described as from Surinam. Cramer's species is now recognized as a widespread member of the Indo-Australian genus *Jamides*. Gmelin (1790 : 2339) repeats Zschach's doubtful identity when dealing with *celeno*. O'Reilly (1813 : 76) places the species without question as '*celerio*', thus repeating the incorrect spelling of Zschach, which stemmed originally from that of Fabricius.

Assuming that the identity with the rather distinctive *celeno* is essentially correct, it would seem very likely that *Papilio* no. 122 actually referred to *Jamides celeno sandya* Fruhstorfer, the subspecies to be found on Ambon. The original material has apparently been destroyed.

? ***Cupido lunulatus* (Gmelin) [Lycaenidae]**

Papilio Plebeii Rurales sp., Zschach, 1788 : 93, no. 130*. 'Eur[ope]'.

Papilio lunulatus; O'Reilly, 1813 : 76, no. 130. 'Europe'.

Papilio sp. no. 130*, *Museum Leskeanum*. Gmelin apparently did not take this species into account. O'Reilly referred it to *Papilio lunulatus*, named by Gmelin on the basis of *Papilio* no. 132 of Zschach. As dealt with above, *lunulatus* itself has never been recognized, and although the specimens of *Papilios* 130 and 132 were evidently both in Dublin in 1813, neither has survived to the present time.

ZSCHACH, CRAMER, AMBON AND SURINAM

Kirby (1869 : 362) makes the following comment about Zschach's work: 'Zschach quotes Linnaeus and Fabricius, but not Cramer or any other authors; in fact, he would seem to have been quite unacquainted with Cramer's work, as it will be noticed that he redescribes several species figured in Pap. Exot.'

As dealt with here, four of the species named by Gmelin from Zschach's descriptions are strictly synonymous with Cramer or Stoll names, and five likewise with Linnaean names. At first sight it may appear odd that such a high proportion of synonyms should be created at a time when only a fraction of the exotic fauna had been described. The answer lies in the limited provenance of much of the early material. I estimate that at least 18 of the 25 species described by Zschach were either from Surinam or Ambon, both major sources for species described by Linnaeus, Cramer, Stoll and others during the latter part of the 18th century. This in turn may be explained by the activities of the Dutch, who from the 16th century had merchants and soldiers travelling the world. These people often brought back 'trophies', notably from their colonies Ceylon, Java, Surinam and Ambon, and thus large quantities of natural history specimens had already accumulated from these places by the middle of the 18th century. Ambon (or Amboina) in particular, despite its small size, was a principal source, no doubt due to its importance as a Dutch military headquarters.

With regard to the synonymy of the Gmelin butterfly names, relevant information concerning the Indo-Australian species described by Linnaeus is presented in a series of papers by Corbet (1941a; 1941b; 1942; 1945; 1949). No similar work exists for the many species described by Cramer and Stoll; the need has not been so acute due to the quality of their original illustrations. So far as I can judge, it has generally been assumed that the Cramer and Stoll specimens, with the possible exception of some material in Leiden (see below), have been lost or destroyed. The following notes relate to the realization in recent years that a percentage of the Cramer material apparently survives among material now preserved in the British Museum (Natural History).

The text of *De Uitlandsche Kappelen* by Cramer, and as continued by Stoll, bears a number of references to the 'rich cabinet of C. van Lennep' and also that of J. C. Sylvius van Lennep; (Cramer, 1775 : [v]). According to Horn & Kahle (1935 : 47; 1936 : 287), the collection of Pieter Cramer passed via C. van Lennep (or one 'van Lennep') to either A. J. van Eyndhoven (whose collections were auctioned in Rotterdam in 1861) or C. V. Felder. The collection of the latter passed to Walter Rothschild, and thus finally to the BMNH. The Rothschild collection contains a considerable number of specimens, ex Felder, which appear to be Cramer, or, at least, van Lennep

material. Many of these bear characteristic labels, with the specific name as given in Cramer written in seraph italic capitals, together with a reference to the appropriate plate. The style of the script bears a very close resemblance to the calligraphy employed in the frontispiece to the plates of Cramer (1775). Some of these specimens also bear circular blue labels of the form employed by Felder, and which normally refer to a country of origin, plus the designation 'Lenep' or 'Lenip'. It thus seems that the source of any likely Cramer material in the Felder collection was indeed one or both of the little-known van Lenneps, and that any specimen bearing reference to 'Lenep', etc., whether it carries a 'Cramer label' or not, should be examined very closely. The BMNH also possesses the original pattern plates for the works of Cramer and Stoll, which facilitates the necessary comparisons. Experience has shown that while a number of specimens with 'Cramer labels' may reasonably be accepted as part of the original type-series, others do not correspond closely enough to the original illustrations at an *individual* level to be accepted unhesitatingly as original type-material. Similarly, some specimens without the Cramer label, but with a Lennep label, seem almost certainly to be type-specimens. Each case has to be treated individually. Eventually it may be possible to produce a catalogue of all such butterfly specimens in the BMNH, cross-checked with material in Leiden (see below).

An as yet unsolved mystery concerns the inclusion of a 'Cramer label' of the type under discussion in Horn & Kahle (1936 : pl. 26, fig. 4). A label of the supposed Cramer type is clearly shown in the photograph, but the caption ascribes it to 'Halbton'. There is no other reference to Halbton in Horn & Kahle, and in fact I have been quite unable to discover any entomologist of such a name. I suggest that Mr Halbton, whose name translated into English means half-tone or semi-tone, is chimerical. It seems to me most likely that the 'Cramer labels' were written either by Cramer, Stoll or C. van Lennep.

With respect to Cramer types in Leiden, Dr R. de Jong (personal communication) informs me that there appear to be none which certainly pertain to the Cramer and Stoll names discussed in the present paper. Dr de Jong also indicates that at present there is no general account of the Cramer material in Leiden. The probable Cramer specimens in the RNH evidently stem from the collections of Raye de Breukelerwaert, M. van der Meulen and van Lennep. Other Cramer material may exist in the Calkoen collection. According to Dr de Jong it is almost impossible to find any particular specimen which perfectly agrees with the figures given in Cramer and Stoll. In my opinion the illustrations in *De Uitlandsche Kappelen* are both somewhat stylised and idealised, but in a very subtle manner.

SUMMARY OF TYPE INFORMATION

GMELIN NAMES. The following names described by Gmelin into the genus *Papilio* are dealt with in this paper:

*aethiops**, *affinis**, *annulatus**, *argyrios*, *barbarus*, *bicolor**, *bifasciatus*, *bipunctatus*, *chrysopterus**, *claviger**, *discors**, *exoticus**, *fenestratus*, *fuliginosus**, *hexophthalmos**, *hyalinus*, *lacteolus**, *leo*, *leucostictos**, *lunulatus*, *marinus**, *oculatus*, *philetas*, *strigosus**, *sulpitia* and *vidua*.

Those names for which lectotypes have been designated are marked with an asterisk. In addition neotypes have been designated for *bipunctatus*, *fenestratus* and *hyalinus*.

TYPE-MATERIAL OF OTHER AUTHORS. Lectotype specimens have been designated in the present work for a number of nominal species described by authors other than Gmelin. These are listed alphabetically by author below, in their original combinations:

Euplaea aglidice Boisduval, *Danaïis leopardus* Butler, *Pyrrhopyga hospita* Butler, *Papilio calisto* Cramer, *Papilio itys* Cramer, *Euploea pasithea* Felder & Felder, *Danaïda juvena ogylla* Fruhstorfer, *Danaïda limniace mutina* Fruhstorfer, *Delias dorimene avenda* Fruhstorfer, *Danaïis meganire* Godart, *Danaïis prothoe* Godart, *Pieris philyra* Godart, *Radena buruensis* Holland, *Tenaris nysa* Hübner, *Papilio ceneus* Linnaeus, *Papilio hecabe* Linnaeus, *Papilio pandarus* Linnaeus, *Papilio pipleis* Linnaeus, *Papilio urania* Linnaeus, *Cecropterus zonilis* Mabilie, *Salpinx oculata* Moore, *Pyrrhopyga ulixes* Plötz and *Papilio cupentus* Stoll.

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BUTTERFLIES NAMED BY GMELIN

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